

# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 1 Problem no.: 10

Juror: S. Byland Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Hungary 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 0

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 4

Opp.: Czech Rep 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent ±1 0

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 5

Rev.: Singapore 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 +1/2

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer 7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 1 Problem no.: 10  
 Juror: Michael F. Smith Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Hungary Singapore 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.8

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.5

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-0.1

Final Grade: Reporter

6

Opp.: Czech 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-0.5

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-0.2

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0.1

Final Grade: Opponent

4

Rev.: Singapore Hungary 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.4

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+0.3

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 1 Problem no.: 10 Singing Blade  
 Juror: Sureerat Homhuan Signature: Sureerat Homhuan

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather and record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult or complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Hungary 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

5

Opp.: Czech R 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

4

Rev.: Sg 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion ✓
- ☐ Expresses own opinion about topics presented or discussed ✓
- ☐ Relevance of questions to both the reporter and the opponent ✓
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

8



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 1 Problem no.: 10  
 Juror: LARS GISEN Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: SINGAPORE 5

### Physics ±3

0.5

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

0.5

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

6

Opp.: CZECH R 5

### Physics ±3

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

5

Rev.: HUNGARY 5

### Physics ±3

0.5

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

0.5

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 1 Problem no.: 10  
 Juror: Kerry Parker Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Tina Banoczki  
Hungary

5

### Physics $\pm 3$

1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

-0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

+0.5

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

5

Opp.: Pavla Bérésová  
Czech Rep.

5

### Physics $\pm 3$

1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

-0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

-0.5

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

4

Rev.: Shen Yu Jun  
Singapore

5

### Physics $\pm 3$

+1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

+0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

+0.5

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 1 Problem no.: 10  
 Juror: Kwang Kim Signature: K Kim

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: HU 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

6

Opp.: CZ 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 +0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: SP 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 +1

- ☒ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

8



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 2 Problem no.: 14

Juror: S. Byland Signature: [Signature]

<p><b>A report should include:</b></p> <ul style="list-style-type: none"> <li>• a <i>presentation</i> of the appropriate <i>concepts, theories and principles</i> of the problem</li> <li>• an <i>explanation</i> of the <i>observed phenomena</i></li> <li>• an <i>application</i> of <i>appropriate mathematics</i></li> <li>• reasonable experimental technique to <i>gather</i> and <i>record data</i> (or <i>demonstrate</i> the <i>phenomena</i> if appropriate)</li> <li>• linking of <i>theoretical</i> and <i>experimental findings</i> to draw <i>suitable conclusions</i></li> <li>• an attempt to communicate <i>difficult</i> or <i>complex</i> ideas in an <i>effective</i> and <i>understandable</i> manner</li> </ul>
<p><b>An opposition should show that:</b></p> <ul style="list-style-type: none"> <li>• the opponent <i>challenged</i> the <i>reporter's understanding</i> of the presented <i>concepts, theories and principles</i></li> <li>• the opponent understood the <i>appropriate mathematics</i> presented</li> <li>• the opponent <i>critiqued</i> the <i>experimental technique</i> used and questioned the <i>validity</i> of the <i>data</i></li> <li>• the opponent appreciated and highlighted the <i>strengths and weaknesses</i> of the report</li> </ul>
<p><b>A review should show that:</b></p> <ul style="list-style-type: none"> <li>• the reviewer succeeded in giving an <i>objective summary</i> of the performances the <i>reporter and opponent</i></li> <li>• the reviewer appreciated the <i>important aspects</i> (especially the <i>controversial</i> ones)</li> <li>• the reviewer's <i>personal opinion</i> was in evidence (<i>not just superficial observations</i>)</li> <li>• such personal opinions were <i>informative, non-trivial</i> and demonstrated, where possible, the reviewer's <i>understanding</i> of <i>concepts, theories, principles and appropriate mathematics</i> used by the reporter and the opponent</li> </ul>

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Greek Rep 5

## Physics ±3

- 1
- ☒ Correct and relevant physics
  - ☒ Scientific approach
  - ☒ Validity of conclusions
  - ☒ Accurate answers

## Presentation ±1

- 0
- ☒ Clear and understandable
  - ☐ Appropriate manner
  - ☒ Overall impression

## Reporter ±1

- 0
- ☒ Quality of experimental technique(s)
  - ☐ Structure
  - ☐ Explanation of formulae and symbols
  - ☐ Appropriate models, conformity of dimensions
  - ☒ Slides, on-site experiments, audio, video, as appropriate
  - ☐ References, proper citations of ideas and input of others
  - ☒ Novelty of the report
  - ☒ Contribution to the discussion

Final Grade: Reporter

4

Opp.: Singapore 5

## Physics ±3

- +1
- ☐ Correct and relevant physics
  - ☐ Scientific approach
  - ☐ Validity of conclusions
  - ☐ Accurate answers

## Presentation ±1

- +1/2
- ☐ Clear and understandable
  - ☐ Appropriate manner
  - ☒ Overall impression

## Opponent ±1

- 0
- ☒ Response to the reporter's solution
  - ☒ Shows the strong and weak points of the report
  - ☒ Finds shortcomings or errors in the report
  - ☒ Relevance of the questions
  - ☒ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Hungary 5

## Physics ±3

- +1/2
- ☒ Correct and relevant physics
  - ☐ Scientific approach
  - ☐ Validity of conclusions
  - ☐ Accurate answers

## Presentation ±1

- 0
- ☐ Clear and understandable
  - ☐ Appropriate manner
  - ☐ Overall impression

## Reviewer ±1

- 0
- ☒ Provides a thorough review of report and discussion
  - ☒ Expresses own opinion about topics presented or discussed
  - ☒ Relevance of questions to both the reporter and the opponent
  - ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 2 Problem no.: 14  
 Juror: Michael F. Smith Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Czech 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 6

Opp.: Singapore 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +0.3

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 0.1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 7

Rev.: Hungary 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 -0.1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 -0.1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer 4



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 2 Problem no.: 14 circle of light  
 Juror: Sureerat Homhuan Signature: Sureerat Homhuan

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Czech Republic 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: Singapore 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Hungary 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 2 Problem no.: 14  
 Juror: LARS GISELA Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: CZECH REP. 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 -1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: SINGAPORE 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: HUNGARY 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

8



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 2 Problem no.: 14  
 Juror: Kerry Parker Signature: Ken B.L.

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Pavla Běrešová  
Czech Republic

5

## Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions?
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

5

Opp.: Lee Yu Tse  
Singapore

5

## Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

## Opponent ±1

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

5

Rev.: A'kos Biro  
Hungary

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 2 Problem no.: 14  
 Juror: Kwang Kim Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: CZ 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 6

Opp.: SP 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent ±1 +1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 6

Rev.: HR 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 0

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer 5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 3 Problem no.: 13  
 Juror: S. Byland Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Singapore 5

### Physics ±3

- +2 1/2
- ☒ Correct and relevant physics
  - ☒ Scientific approach
  - ☒ Validity of conclusions
  - ☐ Accurate answers

Presentation ±1 +1/2

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 +1/2

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

9

Opp.: Hungary 5

### Physics ±3

- +1
- ☐ Correct and relevant physics
  - ☐ Scientific approach
  - ☐ Validity of conclusions
  - ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 +1/2

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Czech Rep 5

### Physics ±3

- 0
- ☐ Correct and relevant physics
  - ☐ Scientific approach
  - ☒ Validity of conclusions
  - ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 -1/2

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 3 Problem no.: 13  
 Juror: Michael F Smith Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Singapore

5

## Physics ±3

+2.8

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

+0.2

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reporter ±1

+0.3

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

8

Opp.: Hungary

5

## Physics ±3

+2

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

+0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

## Opponent ±1

0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Czech

5

## Physics ±3

-0.5

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

0.3

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer ±1

0

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 3 Problem no.: 13 Magnetic pendulum  
 Juror: Sureerat Homhuan Signature: Sureerat Homhuan

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application of appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Singapore

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

9

Final Grade: Reporter

Opp.: Hungary

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

6

Final Grade: Opponent

Rev.: Czech

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

5

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 3 Problem no.: 13  
 Juror: LARS GUNDEL Signature: Lars Gundel

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: SINGAPORE 5

### Physics ±3

2

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

3

Opp.: HUNGARY 5

### Physics ±3

1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: CZECH R 5

### Physics ±3

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): 2 Room: 1 Stage: 3 Problem no.: 13  
 Juror: K Parker Signature: K Parker

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Koh Jin Ming  
Singapore

5

## Physics ±3

2

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

+0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reporter ±1

+0.5

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

8

Opp.: Andras Lauto  
Hungary

5

## Physics ±3

1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

+0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Opponent ±1

+0.5

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Pavel Stepanek  
Czech Republic

5

## Physics ±3

1

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer ±1

+1

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 3 Problem no.: 13  
 Juror: Kwang Kim Signature: K Kim

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather and record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult or complex* ideas in an *effective and understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: SP 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: HR 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: CZ 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



Round: 3 Room: 1 Fight Assistants: Mr. Komson Papawaj, Mr. Thavundon Kongnok

	Stage 1			Stage 2			Stage 3			Stage 4		
Team	Hungary	Czech Rep.	Singapore	Czech Rep.	Singapore	Hungary	Singapore	Hungary	Czech Rep.			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Samuel Byland (Chair)	4	5	7	4 <sup>4</sup>	7 <sup>7</sup>	6	9	7	5			
Michael F. Smith	6	4	7	6	7 <sup>7</sup>	4	8	7	5			
Screeerat Homhuan	5	4	8	4	7 <sup>7</sup>	5	9	6	5			
Lars Gislén	6	5	6	4	7	8	8	6	6			
Kerry Parker	5	4	7	5	5	5	8	7	7			
RWang Joo Kim	6	6	8	6	6	5	7	7	6			
Acting Team Member	Tina	Paula Beresova	Yu Jun Shen	Paula Beresova	Yu Tse Lee	Akos	KOH JIN MING	Andras Lauko	PAVEL			
Rejected Problems												
Accepted Problem	10 Singing Blades of Grass			14 Circle of Light			13 Magnetic Pendulum					

Signature Fight Assistant: Paula Beresova Double-checked with Scoring Guidelines by second Fight Assistant (signature): พญ. วัฒนคุณ กองนอก



# Scoring Guidelines

Fight (Round no.): III Room: 2 Stage: 1 Problem no.: 10  
 Juror: Atyuldyev Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent and reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0.4

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 0.4

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 6 <sup>+</sup>

Opp.: 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 +1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 8 <sup>+</sup>

Rev.: 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 +1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer 8

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 1 Problem no.: 10  
 Juror: Wittaya Kanthanapussatit Signature: Wittaya

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent and reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Germany 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter  $\pm 1$  0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

7

Opp.: Korea 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent  $\pm 1$  1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: USA 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer  $\pm 1$  1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 1 Problem no.: 10

Juror: F. SONG Signature: F. Song

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: 67 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter  $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 5

Opp.: KO 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent  $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 7

Rev.: US 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer  $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer 8



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 1 Problem no.: 10  
 Juror: Julian Ronacher Signature: J. Ronacher

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Germany 5

### Physics ±3

- ☒ Correct and relevant physics  
☒ Scientific approach  
☐ Validity of conclusions  
☐ Accurate answers

### Presentation ±1

- ☒ Clear and understandable  
☐ Appropriate manner  
☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)  
☒ Structure  
☐ Explanation of formulae and symbols  
☐ Appropriate models, conformity of dimensions  
☐ Slides, on-site experiments, audio, video, as appropriate  
☒ References, proper citations of ideas and input of others  
☐ Novelty of the report  
☒ Contribution to the discussion

Final Grade: Reporter

Opp.: Korea 5

### Physics ±3

- ☒ Correct and relevant physics  
☒ Scientific approach  
☒ Validity of conclusions  
☐ Accurate answers

### Presentation ±1

- ☒ Clear and understandable  
☒ Appropriate manner  
☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution  
☐ Shows the strong and weak points of the report  
☐ Finds shortcomings or errors in the report  
☐ Relevance of the questions  
☒ Contribution to the discussion

Final Grade: Opponent

Rev.: USA 5

### Physics ±3

- ☒ Correct and relevant physics  
☐ Scientific approach  
☐ Validity of conclusions  
☒ Accurate answers

### Presentation ±1

- ☒ Clear and understandable  
☐ Appropriate manner  
☒ Overall impression

### Reviewer ±1

- ☒ Provides a thorough review of report and discussion  
☒ Expresses own opinion about topics presented or discussed  
☐ Relevance of questions to both the reporter and the opponent  
☒ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 1 Problem no.: 10  
 Juror: Kent Hogan Signature: [Signature]

## A report should include:

- a presentation of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Germany  
Jonas Landgraf

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1/2

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-1/2

### Reporter ±1

- ☒ Quality of experimental technique(s) Not used (or not shown if it was)
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-1

Final Grade: Reporter

4

Opp.: Korea  
Se Beom Lee

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+2

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+1/2

Final Grade: Opponent

7

Rev.: USA  
John Lukowski

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+1

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 1 Problem no.: 10  
 Juror: Mattias Andersson Signature: M.A.

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Germany 5

### Physics ±3

+1.5

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

+0.5

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

7

Opp.: Korea 5

### Physics ±3

+1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: USA 5

### Physics ±3

+1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

+1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): III Room: 2 Stage: 2 Problem no.: 1 *Packing*  
 Juror: AKyuldjiev Signature: [Signature]

**A report should include:**

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

**An opposition should show that:**

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

**A review should show that:**

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: _____	5	Opp.: _____	5	Rev.: _____	5
<b>Physics ±3</b>	+0.6	<b>Physics ±3</b>	+0.6	<b>Physics ±3</b>	+0.7
<input type="checkbox"/> Correct and relevant physics		<input type="checkbox"/> Correct and relevant physics		<input type="checkbox"/> Correct and relevant physics	
<input type="checkbox"/> Scientific approach		<input type="checkbox"/> Scientific approach		<input type="checkbox"/> Scientific approach	
<input type="checkbox"/> Validity of conclusions		<input type="checkbox"/> Validity of conclusions		<input checked="" type="checkbox"/> Validity of conclusions	
<input type="checkbox"/> Accurate answers		<input type="checkbox"/> Accurate answers		<input type="checkbox"/> Accurate answers	
<b>Presentation ±1</b>	+0.2	<b>Presentation ±1</b>	+0.6	<b>Presentation ±1</b>	+0.6
<input type="checkbox"/> Clear and understandable		<input type="checkbox"/> Clear and understandable		<input type="checkbox"/> Clear and understandable	
<input type="checkbox"/> Appropriate manner		<input type="checkbox"/> Appropriate manner		<input type="checkbox"/> Appropriate manner	
<input type="checkbox"/> Overall impression		<input checked="" type="checkbox"/> Overall impression		<input type="checkbox"/> Overall impression	
<b>Reporter ±1</b>	+0.6	<b>Opponent ±1</b>	+0.6	<b>Reviewer ±1</b>	+0.6
<input type="checkbox"/> Quality of experimental technique(s)		<input type="checkbox"/> Response to the reporter's solution		<input type="checkbox"/> Provides a thorough review of report and discussion	
<input type="checkbox"/> Structure		<input type="checkbox"/> Shows the strong and weak points of the report		<input type="checkbox"/> Expresses own opinion about topics presented or discussed	
<input type="checkbox"/> Explanation of formulae and symbols		<input type="checkbox"/> Finds shortcomings or errors in the report		<input type="checkbox"/> Relevance of questions to both the reporter and the opponent	
<input type="checkbox"/> Appropriate models, conformity of dimensions		<input type="checkbox"/> Relevance of the questions		<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent	
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate		<input type="checkbox"/> Contribution to the discussion			
<input type="checkbox"/> References, proper citations of ideas and input of others					
<input type="checkbox"/> Novelty of the report					
<input type="checkbox"/> Contribution to the discussion					
Final Grade: Reporter	7	Final Grade: Opponent	7	Final Grade: Reviewer	7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 2 Problem no.: 1  
 Juror: Wittaya Kanchanapuskrit Signature: Wittaya

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Korea 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 7

Opp.: USA 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 6

Rev.: Germany 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 0.5

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer 6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 2 Problem no.: 1

Juror: F. SONG Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: KO 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

5

Opp.: US 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: GT 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 2 Problem no.: 7  
 Juror: Julian Ronacher Signature: J. Ronacher

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent and reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Korea 5

### Physics ±3

- ☒ Correct and relevant physics  
☒ Scientific approach  
☐ Validity of conclusions  
☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable  
☐ Appropriate manner  
☐ Overall impression

Reporter ±1 0,2

- ☒ Quality of experimental technique(s)  
☒ Structure  
☐ Explanation of formulae and symbols  
☒ Appropriate models, conformity of dimensions  
☐ Slides, on-site experiments, audio, video, as appropriate  
☐ References, proper citations of ideas and input of others  
☐ Novelty of the report  
☒ Contribution to the discussion

Final Grade: Reporter 7

Opp.: USA 5

### Physics ±3

- ☐ Correct and relevant physics  
☐ Scientific approach  
☐ Validity of conclusions  
☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable  
☐ Appropriate manner  
☐ Overall impression

Opponent ±1 0,2

- ☒ Response to the reporter's solution  
☐ Shows the strong and weak points of the report  
☐ Finds shortcomings or errors in the report  
☐ Relevance of the questions  
☒ Contribution to the discussion

Final Grade: Opponent 4

Rev.: Germany 5

### Physics ±3

- ☐ Correct and relevant physics  
☐ Scientific approach  
☐ Validity of conclusions  
☐ Accurate answers

Presentation ±1 0

- ☒ Clear and understandable  
☐ Appropriate manner  
☐ Overall impression

Reviewer ±1 0,3

- ☐ Provides a thorough review of report and discussion  
☒ Expresses own opinion about topics presented or discussed  
☒ Relevance of questions to both the reporter and the opponent  
☒ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer 6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 2 Problem no.: 1  
 Juror: Kent Hogan Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Korea  
Ahn Cheong-Eung

5  
 +2

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

+1/2

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reporter ±1

-1/2

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

7

Opp.: USA  
Brian Tu

5  
 +1

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Opponent ±1

0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Germany  
Ann-Kathrin Roab

5  
 +1 1/2

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer ±1

+1/2

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 2 Problem no.: 1  
 Juror: Mattias Anderson Signature: M.A.

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Korea 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

8

Opp.: USA 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Germany 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): III Room: 2 Stage: 3 Problem no.: 14  
 Juror: A. Guldjiev Signature: [Signature] *Circle*

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: USA 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 -1.9

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 3

Opp.: Germany 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

Presentation ±1 +0.8

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent ±1 +0.2

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 6

Rev.: Korea 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +0.3

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 +0.5

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer 6



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 3 Problem no.: 14  
 Juror: Wittaya Kanchanapichet Signature: Milky

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: USA 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: Germany 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Korea 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 3 Problem no.: 14  
 Juror: F. GONG Signature: \_\_\_\_\_

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: US 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: GZ 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: KO 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 3 Problem no.: 14

Juror: Julian Ronacher Signature: J. Ronacher

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: USA 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

-2

0

-0.4

3

Opp.: Germany 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

1.7

0

0.5

7

Rev.: Korea 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

2

0.4

0.8

8

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 3 Problem no.: 14  
 Juror: Kent Hogan Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: USA  
Karl Sewick

5

## Physics ±3

-1/2

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

+1/2

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reporter ±1

-1/2

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: Germany  
Ann-Kathrin Raab

5

## Physics ±3

+1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Opponent ±1

0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Korea  
Ahn Cheong-Eung

5

## Physics ±3

+1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer ±1

+1/2

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 3 Problem no.: 14  
 Juror: Mattias Andersson Signature: M.A.

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: USA 5

### Physics ±3

- ☐ Correct and relevant physics +
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable -
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

5

Opp.: Germany 5

### Physics ±3

- ☐ Correct and relevant physics +1
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Korea 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed +
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



Round: 3 Room: 2 Fight Assistants: Kemakorn Pabinong / Jiraporn Saengjae

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Germany	Korea	USA	Korea	USA	Germany	USA	Germany	Korea			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Assen Kyuldjiev	6	8	8	7	7	7	3	6	6			
Wittaya Kanchanapusakit	7	7	7	7	6	6	4	6	7			
Feng Song	5	7	8	5	7	7	4	7	7			
Julian Ronacher	6	6	7	7	4	6	3	7	8			
Kent Hogan	4	7	7	7	6	7	4	6	7			
Mattias Andersson	7	6	7	8	7	7	5	6	5			
Acting Team Member	Jonas Landgraf	SeBeom Lee	John Lukowski	Ahn Cheong - Eung	Brian Tu	Ann - Kathrin Raab	Karl Sewick	Ann - Kathrin Raab	Ahn Cheong - Eung			
Rejected Problems	16, 13											
Accepted Problem	10			1			14					

Signature Fight Assistant: Kemakorn Pabinong Double-checked with Scoring Guidelines by second Fight Assistant (signature): Jiraporn Saengjae



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 1 Problem no.: 6  
 Juror: Kundral Signature: Kundral

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: POLAND

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

+1

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

+1

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

0

Final Grade: Reporter

7

Opp.: AUSTRIA

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-0.5

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+0.5

Final Grade: Opponent

6

Rev.: AUSTRALIA

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+2

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 1 Problem no.: 6  
 Juror: Shchetnikov Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Poland</u>	Opp.: <u>Austria</u>	Rev.: <u>Australia</u>
5	5	5
Physics ±3 -0.5	Physics ±3	Physics ±3
<input checked="" type="checkbox"/> Correct and relevant physics	<input checked="" type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input checked="" type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input checked="" type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
Presentation ±1 +1	Presentation ±1	Presentation ±1
<input checked="" type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input checked="" type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1 +0.5	Opponent ±1	Reviewer ±1 -0.5
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input checked="" type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input checked="" type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input checked="" type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter 6	Final Grade: Opponent 5	Final Grade: Reviewer 5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 1 Problem no.: 6  
 Juror: Felicia Ullstad Signature: Felicia Ullstad

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Poland  
Radosław Waszkiewicz

5

## Physics ±3

- ☐ Correct and relevant physics +
- ☐ Scientific approach
- ☐ Validity of conclusions +
- ☐ Accurate answers +

+2

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reporter ±1

- ☐ Quality of experimental technique(s) -
- ☐ Structure
- ☐ Explanation of formulae and symbols +
- ☐ Appropriate models, conformity of dimensions +
- ☐ Slides, on-site experiments, audio, video, as appropriate +
- ☐ References, proper citations of ideas and input of others +
- ☐ Novelty of the report +
- ☐ Contribution to the discussion

+1

Final Grade: Reporter

8

Opp.: Austria  
Dellali Amir

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Opponent ±1

- ☐ Response to the reporter's solution +
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion -

0

Final Grade: Opponent

6

Rev.: Australia  
Kevin Zhang

5

## Physics ±3

- ☐ Correct and relevant physics +
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed -
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent +

0

Final Grade: Reviewer

5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): III Room: 3 Stage: 1 Problem no: 6  
 Juror: Timoshchenko Signature: \_\_\_\_\_

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Poland

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+2

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-1

Final Grade: Reporter

6

Opp.: Australia

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+0.5

Final Grade: Opponent

6

Rev.: Austria

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 1 Problem no.: 6  
 Juror: Eat Veng Chan Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: PL 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 +1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

7

Opp.: AT 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 +0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 +0.5

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: AU 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation ±1 -0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 +0.5

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 1 Problem no.: 6  
 Juror: Surachate Lukumnerol Signature: Surachate Lukumnerol

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Poland

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

1.5

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-0.5

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

4

Final Grade: Reporter

6

Opp.: Austria

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0

Final Grade: Opponent

5

Rev.: Australia

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

1

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 2 Problem no.: 12  
 Juror: KUNDRAK Signature: Ulcars

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: AUSTRIA 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  +1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter  $\pm 1$  +0.5

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: AUSTRALIA 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  +1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent  $\pm 1$  +1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: POLAND 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  +1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer  $\pm 1$  +1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 2 Problem no.: 12  
 Juror: Shchetnikov Signature: \_\_\_\_\_

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather and record data* (or *demonstrate the phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Austria 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Australia 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Poland 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☒ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 2 Problem no.: 12  
 Juror: Felicia Villstad Signature: Felicia Villstad

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Austria  
Markus Driesel

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-1

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-0.5

Final Grade: Reporter

3

Opp.: Australia  
Elisabeth Cox

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

+2

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

+1

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

+1

Final Grade: Opponent

4

Rev.: Poland  
Anna Wald

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

+1.5

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+0.5

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): III Room: 3 Stage: 2 Problem no.: 12  
 Juror: Timoshchenko Signature: \_\_\_\_\_

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent and reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Austria</u>	Opp.: <u>Australia</u>	Rev.: <u>Poland</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter <u>4</u>	Final Grade: Opponent <u>5</u>	Final Grade: Reviewer <u>8</u>

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 2 Problem no.: 12  
 Juror: Tat Ngai Chan Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>AT</u>	Opp.: <u>AU</u>	Rev.: <u>PL</u>
<div>5</div>	<div>5</div>	<div>5</div>
<div>0</div>	<div>0</div>	<div>+0.5</div>
<b>Physics ±3</b>	<b>Physics ±3</b>	<b>Physics ±3</b>
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
<b>Presentation ±1</b>	<b>Presentation ±1</b>	<b>Presentation ±1</b>
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
<b>Reporter ±1</b>	<b>Opponent ±1</b>	<b>Reviewer ±1</b>
<div>+0.5</div>	<div>+0.5</div>	<div>+0.5</div>
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reporter

6

Final Grade: Opponent

6

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 2 Problem no.: 12

Juror: S. Limkyamwong Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Austria</u>	Opp.: <u>Australia</u>	Rev.: <u>Poland</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter <u>5</u>	Final Grade: Opponent <u>5</u>	Final Grade: Reviewer <u>7</u>

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 3 Problem no.: 7  
 Juror: KUADRACIL Signature: Maercker

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: AUSTRALIA 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: POLAND 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

8

Rev.: AUSTRALIA 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 3 Problem no.: 7  
 Juror: Shechetnikov Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application of appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Australia 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

3

Opp.: Poland 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Austria 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 3 Problem no.: 7  
 Juror: Felicia Ulstad Signature: Felicia Ulstad

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Australia  
Kevin Zhang 5

### Physics ±3

- ☐ Correct and relevant physics +
- ☐ Scientific approach -
- ☐ Validity of conclusions
- ☐ Accurate answers +

### Presentation ±1

- ☐ Clear and understandable -
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s) -
- ☐ Structure -
- ☐ Explanation of formulae and symbols -
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate -
- ☐ References, proper citations of ideas and input of others +
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Poland  
Krzysztof Wasz 5

### Physics ±3

- ☐ Correct and relevant physics +
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers +

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution +
- ☐ Shows the strong and weak points of the report +
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Austria  
Markus Riese 5

### Physics ±3

- ☐ Correct and relevant physics +
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion +
- ☐ Expresses own opinion about + topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent +
- ☐ Draws attention to points missed + by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): III Room: 3 Stage: 3 Problem no.: 7  
 Juror: Timoschenko Signature: \_\_\_\_\_

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Australia</u>	Opp.: <u>Poland</u>	Rev.: <u>Australia</u>
5	5	5
Physics ±3 -1	Physics ±3 +2	Physics ±3 +1
<input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers	<input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers	<input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input checked="" type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers
Presentation ±1 -1	Presentation ±1 +0.5	Presentation ±1 0
<input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input type="checkbox"/> Overall impression	<input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input type="checkbox"/> Overall impression
Reporter ±1 0	Opponent ±1 +0.5	Reviewer ±1 0
<input type="checkbox"/> Quality of experimental technique(s) <input type="checkbox"/> Structure <input type="checkbox"/> Explanation of formulae and symbols <input type="checkbox"/> Appropriate models, conformity of dimensions <input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate <input type="checkbox"/> References, proper citations of ideas and input of others <input type="checkbox"/> Novelty of the report <input type="checkbox"/> Contribution to the discussion	<input type="checkbox"/> Response to the reporter's solution <input type="checkbox"/> Shows the strong and weak points of the report <input type="checkbox"/> Finds shortcomings or errors in the report <input type="checkbox"/> Relevance of the questions <input type="checkbox"/> Contribution to the discussion	<input type="checkbox"/> Provides a thorough review of report and discussion <input type="checkbox"/> Expresses own opinion about topics presented or discussed <input type="checkbox"/> Relevance of questions to both the reporter and the opponent <input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
Final Grade: Reporter 3	Final Grade: Opponent 8	Final Grade: Reviewer 6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 3 Problem no.: 7  
 Juror: Iat Neng Chom Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>AU</u>	Opp.: <u>PL</u>	Rev.: <u>AT</u>
5	5	5
0	0	0
<b>Physics ±3</b>	<b>Physics ±3</b>	<b>Physics ±3</b>
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
<b>Presentation ±1</b>	<b>Presentation ±1</b>	<b>Presentation ±1</b>
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
<b>Reporter ±1</b>	<b>Opponent ±1</b>	<b>Reviewer ±1</b>
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reporter

4

Final Grade: Opponent

7

Final Grade: Reviewer

6

Revised after IOC feedback and approved by EC on 2011-11-03



# Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 3 Problem no.: 7  
 Juror: S. Linkumnerd Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather and record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Australia

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-1

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-1

Final Grade: Reporter

3

Opp.: Poland

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

3

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

-1

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

1

Final Grade: Opponent

8

Rev.: Australia

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

2

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0

Final Grade: Reviewer

7

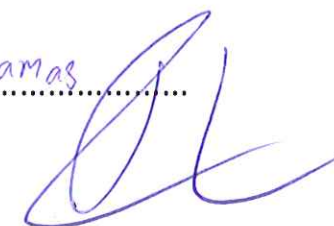
This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



Round: 3 Room: 3 Fight Assistants: Jaru Jutimoosik : Rojnapa Tharamas

	Stage 1			Stage 2			Stage 3			Stage 4		
Team	POL	AUT	AUS				AUS	POL	AUT			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
František Kundracik	7	6	7	5	6	9	4	8	7			
Andrey Shchetnikov	6	5	5	3	5	8	3	6	7			
Felicia Ullstad	8	6	5	3	9	7	3	6	7			
Igor Timoshchenko	6	6	5	4	5	8	3	8	6			
Iat Neng Chan	7	6	5	6	6	7	4	7	6			
Surachate Limkumnerd	6	5	6	5	5	7	3	8	7			
Acting Team Member	Radosł Waszkiewicz	Amir Dellali	Kevin Zhang	Markus Niese	Elizabeth Cox	Anna Wald	Kevin Zhang	Radosł Waszkiewicz	Markus Niese			
Rejected Problems	7 Shaded Pole			-			-					
Accepted Problem	6 Magnus Glider			12 Thick lens			7 shaded Pole					

Signature Fight Assistant: Jaru Jutimoosik Double-checked with Scoring Guidelines by second Fight Assistant (signature): Rojnapa Tharamas





# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 1 Problem no.: 13  
 Juror: Lobyshev Signature: Shcherbakov

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Dr. Brit 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 1 Problem no.: 13  
 Juror: SUE NAIER Signature: SF Cooper

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: UK Tom Dodd 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s) *Some said per*
- ☐ Structure
- ☐ Explanation of formulae and symbols *NA really*
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate *Not given*
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Thailand Dan Powakapan 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Iran Shahrooz Majidi, Bak 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 1 Problem no.: 13.

Juror: HÖKÖSTREI, MIHÁLY Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:                      5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.5

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.5

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

0

Final Grade: Reporter

6

Opp.:                      5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0

Final Grade: Opponent

5

Rev.:                      5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.5

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.5

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

1

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 1 Problem no.: #13  
 Juror: Hung-Chih Kan Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>UK</u>	Opp.: <u>TH</u>	Rev.: <u>IR</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input checked="" type="checkbox"/> Correct and relevant physics	<input checked="" type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input checked="" type="checkbox"/> Clear and understandable	<input checked="" type="checkbox"/> Clear and understandable	<input checked="" type="checkbox"/> Clear and understandable
<input checked="" type="checkbox"/> Appropriate manner	<input checked="" type="checkbox"/> Appropriate manner	<input checked="" type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input checked="" type="checkbox"/> Response to the reporter's solution	<input checked="" type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input checked="" type="checkbox"/> Shows the strong and weak points of the report	<input checked="" type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input checked="" type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input checked="" type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter <u>4</u>	Final Grade: Opponent <u>6</u>	Final Grade: Reviewer <u>6</u>

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 1 Problem no.: 13

Juror: O'NEILL Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:	Opp.:	Rev.:
5	5	5
0	0	0
<b>Physics ±3</b>	<b>Physics ±3</b>	<b>Physics ±3</b>
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input checked="" type="checkbox"/> Correct and relevant physics
<input checked="" type="checkbox"/> Scientific approach	<input checked="" type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input checked="" type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
<b>Presentation ±1</b>	<b>Presentation ±1</b>	<b>Presentation ±1</b>
<input checked="" type="checkbox"/> Clear and understandable	<input checked="" type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input checked="" type="checkbox"/> Appropriate manner	<input checked="" type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
<b>Reporter ±1</b>	<b>Opponent ±1</b>	<b>Reviewer ±1</b>
<input checked="" type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reporter

5

Final Grade: Opponent

5

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 1 Problem no.: 13  
 Juror: Uno Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>UK</u>	Opp.: <u>Thailand</u>	Rev.: <u>Iran</u>
5	5	5
<b>Physics ±3</b>	<b>Physics ±3</b>	<b>Physics ±3</b>
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
<b>Presentation ±1</b>	<b>Presentation ±1</b>	<b>Presentation ±1</b>
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
<b>Reporter ±1</b>	<b>Opponent ±1</b>	<b>Reviewer ±1</b>
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reporter

4

Final Grade: Opponent

6

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 2 Problem no.: 16  
 Juror: Uno Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application of appropriate mathematics* • reasonable experimental technique to *gather and record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult or complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Thailand 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Iran 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: UK 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 2 Problem no.: 16

Juror: O'NEILL Signature: P90Mail

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories* and *principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles* and *appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: THAILAND 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

Opp.: IRAN 5

### Physics ±3

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

Rev.: UK 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 2 Problem no.: 16  
 Juror: Hung-Chih Kuo Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Th</u>	Opp.: <u>IR</u>	Rev.: <u>GB</u>
<div>5</div>	<div>5</div>	<div>5</div>
<b>Physics ±3</b>	<b>Physics ±3</b>	<b>Physics ±3</b>
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input checked="" type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input checked="" type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
<b>Presentation ±1</b>	<b>Presentation ±1</b>	<b>Presentation ±1</b>
<input checked="" type="checkbox"/> Clear and understandable	<input checked="" type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input checked="" type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
<b>Reporter ±1</b>	<b>Opponent ±1</b>	<b>Reviewer ±1</b>
<input checked="" type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input checked="" type="checkbox"/> Provides a thorough review of report and discussion
<input checked="" type="checkbox"/> Structure	<input checked="" type="checkbox"/> Shows the strong and weak points of the report	<input checked="" type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input checked="" type="checkbox"/> Finds shortcomings or errors in the report	<input checked="" type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input checked="" type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reporter

4

Final Grade: Opponent

5

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 2 Problem no.: 16

Juror: H. KOSTREI, M. HAKY Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: THAILAND

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

6

Final Grade: Reporter

5

Opp.: IRAN

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

+0.5

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+0.5

Final Grade: Opponent

6

Rev.: UK

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

+0.5

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+0.5

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



Regat 4 Reject 11

2

# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 3 Problem no.: 16  
Juror: SUE NAPIER Signature: S. Napier

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather and record data* (or *demonstrate the phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Penithan 5  
Jeerasak

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Anahita 5  
Abdollahi

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Don 5  
Obotson

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

Revised after IOC feedback and approved by EC on 2011-11-03



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 2 Problem no.: \_\_\_\_\_  
 Juror: Lobyshev Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather and record data* (or *demonstrate the phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult or complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:	Opp.:	Rev.:
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reporter

4

Final Grade: Opponent

6

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 3 Problem no.: 1  
 Juror: Lobyshev Signature: Khokh

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:	Opp.:	Rev.:
5	5	5
1	1	1
<b>Physics ±3</b>	<b>Physics ±3</b>	<b>Physics ±3</b>
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
<b>Presentation ±1</b>	<b>Presentation ±1</b>	<b>Presentation ±1</b>
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
<b>Reporter ±1</b>	<b>Opponent ±1</b>	<b>Reviewer ±1</b>
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reporter

8

Final Grade: Opponent

6

Final Grade: Reviewer

7

Revised after IOC feedback and approved by EC on 2011-11-03



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 3 Problem no.: 1  
 Juror: SUE NAPIER Signature: S. Napier

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather and record data* (or *demonstrate the phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Adhollon 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure OK
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion 6

Final Grade: Reporter

Opp.: Tom Dodd 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Philip 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 3 Problem no.: 1

Juror: H. MÖSTRE, K. HALL Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>IRAN</u>	Opp.: <u>UK</u>	Rev.: <u>THAILAND</u>
5	5	5
0	+1	0
<b>Physics ±3</b>	<b>Physics ±3</b>	<b>Physics ±3</b>
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
<b>Presentation ±1</b>	<b>Presentation ±1</b>	<b>Presentation ±1</b>
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
<b>Reporter ±1</b>	<b>Opponent ±1</b>	<b>Reviewer ±1</b>
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reporter

4

Final Grade: Opponent

7

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 3 Problem no.: 1  
 Juror: Hung-Chih Kuo Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:	Opp.:	Rev.:
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input checked="" type="checkbox"/> Correct and relevant physics	<input checked="" type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input checked="" type="checkbox"/> Scientific approach	<input checked="" type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input checked="" type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input checked="" type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input checked="" type="checkbox"/> Appropriate manner	<input checked="" type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input checked="" type="checkbox"/> Response to the reporter's solution	<input checked="" type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input checked="" type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input checked="" type="checkbox"/> Finds shortcomings or errors in the report	<input checked="" type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reporter

4

Final Grade: Opponent

6

Final Grade: Reviewer

7

Revised after IOC feedback and approved by EC on 2011-11-03



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 3 Problem no.: 1

Juror: O'NEILL Signature: PJO'Neill

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: IRAN

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

1/2

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

1/2

Final Grade: Reporter

7

Opp.: UK

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

1/2

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

1/2

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

1

Final Grade: Opponent

7

Rev.: THAILAND

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

1/2

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

1/2

## Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

1

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 3 Problem no.: 1  
 Juror: Ueno Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Iran 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

6

Opp.: UK 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Thailand 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



Round: 3 Room: 4 Fight Assistants: Barn Minjarsomphan, Adithip Butrabusi

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Valentin Lobyshev	5	6	8	4	6	7	8	6	7			
Susan Napier	5	5	6	4	5	7	6	6	5			
Miha'ly Homöstoei	6	5	7	5	6	6	4	7	5			
Hung-Chin Kan	4	6	6	4	5	7	4	6	7			
Philip O'Neill	5	5	7	4	5	8	7	7	7			
Uno Uno	4	6	7	5	6	5	6	6	6			
Acting Team Member	Tom Dodd	Pian Pawakapan	Ghazal Nughdikh	Donithan Jeeraru Wannakul	Anahita Abdollahi	Dominic Dootson	Anahita Abdollahi	Tom Dodd	Pian Pawakapan			
Rejected Problems				No. 4 Liquid film motor No. 11 Cat's Whiskers.								
Accepted Problem	No. 13 Magnetic Pendulum.			No. 16 Wet and Dark.			No. 1 Packing.					

Signature Fight Assistant: ..... Double-checked with Scoring Guidelines by second Fight Assistant (signature): .....



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 1 Problem no: 9  
 Juror: Kathryn Zealand Signature: KZ

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Sack

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reporter $\pm 1$

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

6

Opp.: Dimitrie

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☒ Contribution to the discussion

*misunderstood core aspects of his presentation.*

Final Grade: Opponent

5

Rev.: Ivuga

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

2



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 1 Problem no.: 7

Juror: Nirut Signature: Nirut

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>NZ</u>	Opp.: <u>RO</u>	Rev.: <u>KE</u>
<b>Physics ±3</b> <input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers	<b>Physics ±3</b> <input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers	<b>Physics ±3</b> <input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input checked="" type="checkbox"/> Validity of conclusions <input checked="" type="checkbox"/> Accurate answers
<b>Presentation ±1</b> <input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input type="checkbox"/> Overall impression	<b>Presentation ±1</b> <input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input checked="" type="checkbox"/> Overall impression	<b>Presentation ±1</b> <input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input checked="" type="checkbox"/> Overall impression
<b>Reporter ±1</b> <input type="checkbox"/> Quality of experimental technique(s) <input type="checkbox"/> Structure <input type="checkbox"/> Explanation of formulae and symbols <input type="checkbox"/> Appropriate models, conformity of dimensions <input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate <input type="checkbox"/> References, proper citations of ideas and input of others <input type="checkbox"/> Novelty of the report <input type="checkbox"/> Contribution to the discussion	<b>Opponent ±1</b> <input type="checkbox"/> Response to the reporter's solution <input type="checkbox"/> Shows the strong and weak points of the report <input type="checkbox"/> Finds shortcomings or errors in the report <input type="checkbox"/> Relevance of the questions <input type="checkbox"/> Contribution to the discussion	<b>Reviewer ±1</b> <input type="checkbox"/> Provides a thorough review of report and discussion <input type="checkbox"/> Expresses own opinion about topics presented or discussed <input type="checkbox"/> Relevance of questions to both the reporter and the opponent <input type="checkbox"/> Draws attention to points missed by the reporter or the opponent

Final Grade: Reporter

5

Final Grade: Opponent

5

Final Grade: Reviewer

4

Revised after IOC feedback and approved by EC on 2011-11-03

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3.1 Room: 5 Stage: 1 Problem no.: 9  
 Juror: Olga Inisheva Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>New Z</u>	Opp.: <u>Ro</u>	Rev.: <u>Kenya</u>
5	5	5
0	0	-1
<b>Physics ±3</b>	<b>Physics ±3</b>	<b>Physics ±3</b>
<input checked="" type="checkbox"/> Correct and relevant physics	<input checked="" type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input checked="" type="checkbox"/> Scientific approach	<input checked="" type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input checked="" type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
<b>Presentation ±1</b>	<b>Presentation ±1</b>	<b>Presentation ±1</b>
<input checked="" type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input checked="" type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input checked="" type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
<b>Reporter ±1</b>	<b>Opponent ±1</b>	<b>Reviewer ±1</b>
0	0.25	-1
<input type="checkbox"/> Quality of experimental technique(s)	<input checked="" type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input checked="" type="checkbox"/> Structure	<input checked="" type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input checked="" type="checkbox"/> Explanation of formulae and symbols	<input checked="" type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input checked="" type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input checked="" type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter <u>5</u>	Final Grade: Opponent <u>5</u>	Final Grade: Reviewer <u>3</u>

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 1 Problem no.: 9  
 Juror: Andres Velasco Signature: Kanuman

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: New Zealand

5

Jack Tregidga

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

+0.5

Final Grade: Reporter

6

Opp.: Romania

5

Dimitrie Nitelky

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+0.5

Final Grade: Opponent

4

Rev.: Kenya

5

Kenya

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

-1

Final Grade: Reviewer

2

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 1 Problem no.: 9  
 Juror: STANISLAV PAULOS Signature: Pavlos

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application of appropriate mathematics* • reasonable experimental technique to *gather and record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult or complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: NEW ZEALAND

5

## Physics $\pm 3$

0

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

## Presentation $\pm 1$

+0.5

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

## Reporter $\pm 1$

+0.5

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

☒ graphs

Final Grade: Reporter

6

Opp.: ROMANIA

5

## Physics $\pm 3$

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation $\pm 1$

0

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

## Opponent $\pm 1$

0

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

5

Rev.: KENYA

5

## Physics $\pm 3$

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation $\pm 1$

0

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer $\pm 1$

0

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 1 Problem no.: 9

Juror: Günke Exner Signature: Mug

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories* and *principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: NZ 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

5

Opp.: Ro 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

4

Rev.: k 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 2 Problem no.: 16  
 Juror: Kathryn Teland Signature: KTM

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Alex 5  
*very basic* *Romana*

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

3

Opp.: Xiong Keryn 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

2

Rev.: Nikh NZ 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☒ Appropriate manner *don't yell*
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion *Le Summary*
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 2 Problem no.: 16

Juror: Nirut Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: RO 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: KE 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

3

Rev.: NZ 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 2 Problem no.: 16

Juror: Alga Inisheva Signature: Alga Inisheva

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Ro</u>	Opp.: <u>Ke</u>	Rev.: <u>New Zealand</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input checked="" type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input checked="" type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input checked="" type="checkbox"/> Clear and understandable	<input checked="" type="checkbox"/> Clear and understandable	<input checked="" type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input checked="" type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input checked="" type="checkbox"/> Response to the reporter's solution	<input checked="" type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input checked="" type="checkbox"/> Expresses own opinion about topics presented or discussed
<input checked="" type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input checked="" type="checkbox"/> Appropriate models, conformity of dimensions	<input checked="" type="checkbox"/> Relevance of the questions	<input checked="" type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input checked="" type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input checked="" type="checkbox"/> Contribution to the discussion	
<input checked="" type="checkbox"/> References, proper citations of ideas and input of others		
<input checked="" type="checkbox"/> Novelty of the report		
<input checked="" type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter <u>3</u>	Final Grade: Opponent <u>3</u>	Final Grade: Reviewer <u>7</u>

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 2 Problem no.: \_\_\_\_\_  
 Juror: Alexandro B. Edut Signature: Alain

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Romania

5

Alexandro B. Edut

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-0.5

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-0.5

Final Grade: Reporter

3

Opp.: Kenya

5

Xiang Zhuang

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

-1

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

-1

Final Grade: Opponent

2

Rev.: New Zealand

5

Nicholas Lam

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

+1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+1

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 2 Problem no.: 16  
 Juror: STANISLAV PAVOS Signature: Pavos

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather and record data* (or *demonstrate the phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: ROMANIA 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 -1

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 3

Opp.: KENYA 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 -1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 -1

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 2

Rev.: NEW ZEALAND 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation ±1 +1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

Reviewer ±1 +1

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer 7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 2 Problem no.: 16

Juror: George Baker Signature: dy

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Ro 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

3

Opp.: Kenya 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

3

Rev.: NE 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 3 Problem no.: 8  
 Juror: KZ Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Kenza

5

## Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

-2

## Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

-1

## Reporter ±1

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☐ Contribution to the discussion

-1/2

Final Grade: Reporter

1.5 ↑ 2

Opp.: NZ

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+1/2

## Opponent ±1

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+1/2

Final Grade: Opponent

7

Rev.: Romana

5

## Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

+1 1/2

## Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+1/2

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 3 Problem no.: 8  
 Juror: Nirut Signature: Nirut

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>KE</u>	Opp.: <u>NZ</u>	Rev.: <u>RO</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers	<input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers	<input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input checked="" type="checkbox"/> Validity of conclusions <input checked="" type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input type="checkbox"/> Overall impression	<input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s) <input type="checkbox"/> Structure <input type="checkbox"/> Explanation of formulae and symbols <input type="checkbox"/> Appropriate models, conformity of dimensions <input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate <input type="checkbox"/> References, proper citations of ideas and input of others <input type="checkbox"/> Novelty of the report <input type="checkbox"/> Contribution to the discussion	<input type="checkbox"/> Response to the reporter's solution <input type="checkbox"/> Shows the strong and weak points of the report <input type="checkbox"/> Finds shortcomings or errors in the report <input type="checkbox"/> Relevance of the questions <input type="checkbox"/> Contribution to the discussion	<input type="checkbox"/> Provides a thorough review of report and discussion <input type="checkbox"/> Expresses own opinion about topics presented or discussed <input type="checkbox"/> Relevance of questions to both the reporter and the opponent <input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer
3	6	6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 3 Problem no.: 8  
 Juror: Olga Inisheva Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Kenya

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-2

## Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

-1

Final Grade: Reporter

3

Opp.: New Zealand

5

## Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1.5

## Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

+0.25

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☒ Contribution to the discussion

+0.75

Final Grade: Opponent

8

Rev.: Romania

5

## Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

+1

## Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.25

## Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

+0.75

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 3 Problem no.: 8  
 Juror: Andre Kishin Signature: Kishin

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Kenya  
Xiong Zhuang

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-2

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-1

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-1

Final Grade: Reporter

1

Opp.: New Zealand  
Matthew Poudle

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

+1

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+1

Final Grade: Opponent

8

Rev.: Romonda  
Alice Golding

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

+1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+1

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 3 Problem no.: 8  
 Juror: STANISLAV PALOS Signature: Palos

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories** and **principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter** and **opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles** and **appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: KENYA

5

## Physics ±3

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

-1

## Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

-1

## Reporter ±1

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions NO MODEL?
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

-1

Final Grade: Reporter

2

Opp.: N. ZEALAND

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

+1

## Opponent ±1

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+1

Final Grade: Opponent

7

Rev.: ROMANIA

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

+1

## Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+1

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 3 Problem no.: 8

Juror: Günke Exner Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Kenya</u>	Opp.: <u>NZ</u>	Rev.: <u>Ro</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter <u>2</u>	Final Grade: Opponent <u>8</u>	Final Grade: Reviewer <u>7</u>

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



Round: 3 Room: 5 Fight Assistants: Wanchalaen Pansamant, Taweesak Chaiyakham

	Stage 1			Stage 2			Stage 3			Stage 4		
Team	New Zealand	Romania	Kenya	Romania	Kenya	New Zealand	Kenya	New Zealand	Romania			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Kathryn Zealand	6	5	2	3	2	7	2	7	7			
Nimt Pussadee	5	5	4	4	3	6	3	6	6			
Olga Inisheva	5	5	3	3	3	7	3	8	7			
Andrei Klishin	6	4	2	3	2	7	1	8	7			
Stanislav Panos	6	5	5	3	2	7	2	7	7			
Ginka Exner	5	4	5	3	3	6	2	8	7			
Acting Team Member	Jack Tregidga	Dimitrie Mititelu	Ingva Wanjan	Alexandra Basut	Xiong Zhuang	Nicholas Lam	Xiong Zhuang	Mathew Randle	Anca Goldis			
Rejected Problems	-			-			-					
Accepted Problem	⑨ Hovercraft			⑩ Wet and dark			⑧ Sugar and salt					

Signature Fight Assistant: Wanchalaen Pansamant Double-checked with Scoring Guidelines by second Fight Assistant (signature): Taweesak



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 1 Problem no.: \_\_\_\_\_

Juror: D. Keller Signature: D. Keller

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: China 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: Brazil 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

5

Rev.: Sweden 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 1 Problem no.: 9

Juror: Dina Ixadi Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Zhen Yan Gong  
China

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.5

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.5

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

0

Final Grade: Reporter

5

Opp.: Thiagra Bergamoti  
Brazil

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

-0.5

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+0.5

Final Grade: Opponent

6

Rev.: Tomas Erik  
Sweden

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.5

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+0.5

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): III Room: 6 Stage: I Problem no.: 9  
 Juror: PANOŠOVA' DAGMAR Signature: Pau.

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: China

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Reporter ±1

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

+1/2

Final Grade: Reporter

5

Opp.: Brazil

5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

+1

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

0

### Opponent ±1

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☒ Contribution to the discussion

+1/2

Final Grade: Opponent

6

Rev.: Sweden

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

0

### Presentation ±1

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

-1/2

### Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0

Final Grade: Reviewer

5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: #6 Stage: 2 Problem no.: 9 (Hawcraft)  
 Juror: Apichart Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: China  
(Zhenyan Gong)

5

## Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

## Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0.5

## Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

0.5

Final Grade: Reporter

7

Opp.: Brazil  
(Thiago)

5

## Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+2

## Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0.5

## Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0.5

Final Grade: Opponent

8

Rev.: Sweden  
(Thomas)

5

## Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

## Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+1

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 1 Problem no.: 9

Juror: PENGBAN Signature: T. Pengpan

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: CN 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

0.5

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0.5

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

1

Final Grade: Reporter

7

Opp.: BR 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0.5

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

0.5

Final Grade: Opponent

6

Rev.: SE 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0.5

### Reviewer $\pm 1$

- ☒ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

1.5

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 1 Problem no.: 9  
 Juror: REAPER Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather and record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: China  
Zhang Guoqiang

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

0

Final Grade: Reporter

6

Opp.: Brazil  
Thiago Bergamaschi

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

+0.5

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+0.5

Final Grade: Opponent

6

Rev.: Saudi  
Touqeer Ali

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.5

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

-0.5

Final Grade: Reviewer

5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 2 Problem no.: 6  
 Juror: D. Keller Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Brazil 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 5

Opp.: Schweden 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent ±1 0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 5

Rev.: China 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation ±1 +1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 0

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer 6



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 2 Problem no.: 6

Juror: Dina Izadi Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Thiago  
Brazil

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

5

Final Grade: Reporter

Opp.: Ibur  
Sweden

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

6

Final Grade: Opponent

Rev.: Keham  
China

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

5

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): III Room: 6 Stage: II Problem no.: 6  
 Juror: PAVOŠOVA' DAGMAR Signature: Mu

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Bhutan

5

### Physics ±3

+2

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

-1/2

- ☒ Clear and understandable *3d gr.*
- ☒ Appropriate manner
- ☐ Overall impression

### Reporter ±1

+0

- ☐ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

7

Opp.: Sweden

5

### Physics ±3

+2

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

+1/2

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Opponent ±1

0

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

7

Rev.: China

5

### Physics ±3

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

+1/2

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

+1

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): 3 Room: #6 Stage: 1 Problem no.: 6 (magnus)  
 Juror: Apichart Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Brazil</u> ( <u>Thiago</u> )	Opp.: <u>Sweden</u> ( <u>Ivar</u> )	Rev.: <u>China</u> ( <u>Ke Han</u> )
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer
7	6	7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 2 Problem no.: \_\_\_\_\_

Juror: PENABAN Signature: T. Pengpan

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: _____	5	Opp.: _____	5	Rev.: _____	5
<b>Physics ±3</b>	1.5	<b>Physics ±3</b>	1	<b>Physics ±3</b>	1
<input checked="" type="checkbox"/> Correct and relevant physics		<input type="checkbox"/> Correct and relevant physics		<input checked="" type="checkbox"/> Correct and relevant physics	
<input checked="" type="checkbox"/> Scientific approach		<input type="checkbox"/> Scientific approach		<input checked="" type="checkbox"/> Scientific approach	
<input checked="" type="checkbox"/> Validity of conclusions		<input type="checkbox"/> Validity of conclusions		<input checked="" type="checkbox"/> Validity of conclusions	
<input checked="" type="checkbox"/> Accurate answers		<input type="checkbox"/> Accurate answers		<input type="checkbox"/> Accurate answers	
<b>Presentation ±1</b>	1	<b>Presentation ±1</b>	0.5	<b>Presentation ±1</b>	1
<input checked="" type="checkbox"/> Clear and understandable		<input checked="" type="checkbox"/> Clear and understandable		<input checked="" type="checkbox"/> Clear and understandable	
<input checked="" type="checkbox"/> Appropriate manner		<input type="checkbox"/> Appropriate manner		<input type="checkbox"/> Appropriate manner	
<input checked="" type="checkbox"/> Overall impression		<input type="checkbox"/> Overall impression		<input checked="" type="checkbox"/> Overall impression	
<b>Reporter ±1</b>	0.5	<b>Opponent ±1</b>	0.5	<b>Reviewer ±1</b>	1
<input checked="" type="checkbox"/> Quality of experimental technique(s)		<input type="checkbox"/> Response to the reporter's solution		<input checked="" type="checkbox"/> Provides a thorough review of report and discussion	
<input type="checkbox"/> Structure		<input type="checkbox"/> Shows the strong and weak points of the report		<input checked="" type="checkbox"/> Expresses own opinion about topics presented or discussed	
<input type="checkbox"/> Explanation of formulae and symbols		<input type="checkbox"/> Finds shortcomings or errors in the report		<input checked="" type="checkbox"/> Relevance of questions to both the reporter and the opponent	
<input type="checkbox"/> Appropriate models, conformity of dimensions		<input checked="" type="checkbox"/> Relevance of the questions		<input checked="" type="checkbox"/> Draws attention to points missed by the reporter or the opponent	
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate		<input checked="" type="checkbox"/> Contribution to the discussion			
<input type="checkbox"/> References, proper citations of ideas and input of others					
<input type="checkbox"/> Novelty of the report					
<input type="checkbox"/> Contribution to the discussion					
Final Grade: Reporter	8	Final Grade: Opponent	7	Final Grade: Reviewer	8

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 2 Problem no.: 6  
 Juror: LEAVER Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Brazil 5  
Thiago Regener +1.5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Saudi 5  
Ivan Eriksson +0.5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Rina 5  
Alihan Liv +1

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 3 Problem no.: 15  
 Juror: D. Keller Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Sweden 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

3

Opp.: China 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Brazil 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 3 Problem no.: 15

Juror: Dina Isadi Signature: A. Zaidis

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Juror  
Sweden

5

## Physics ±3

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reporter ±1

-1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: Jiahong  
China

5

## Physics ±3

+1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

## Presentation ±1

0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

## Opponent ±1

0.5

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Thiago  
Brazil

5

## Physics ±3

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

## Presentation ±1

0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer ±1

0.5

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): IV. Room: 6. Stage: IV. Problem no.: 15.  
 Juror: PANOŠEVA' DAGMAR Signature: PMU.

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Sweden

5

### Physics ±3

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-1

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

0

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

0

Final Grade: Reporter

4

Opp.: China

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

### Opponent ±1

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☒ Contribution to the discussion

+1

Final Grade: Opponent

6

Rev.: Brazil

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

0

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

+1/2

### Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+1

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: #6 Stage: 1 Problem no.: 15 (Gravity)  
 Juror: Apichart Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Sweden  
(Ivar)

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

5

Final Grade: Reporter

Opp.: China  
(Jiahong)

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

7

Final Grade: Opponent

Rev.: Brazil  
(Thiago)

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

6

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 3 Problem no.: 15

Juror: PENGPAN Signature: T. Pengpan

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: SE

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

0.5

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

0.5

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-

Final Grade: Reporter

6

Opp.: CN

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0.5

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0.5

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

1

Final Grade: Opponent

7

Rev.: BR

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

-

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0.5

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0.5

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 6 Stage: 3 Problem no.: 15  
 Juror: REXNER Signature: Reger

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Sander  
Ivar Erikson

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0,5

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-0,5

Final Grade: Reporter

4

Opp.: Qina  
Guo Wang Yi

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+2

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+1

Final Grade: Opponent

8

Rev.: Brazil  
Lianna Kallie

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

+1

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+1

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+1

Final Grade: Reviewer

8

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



Round: 3 Room: 6 Fight Assistants: .....

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	China	Brazil	Sweden	Brazil	Sweden	China	Sweden	China	Brazil	Rep	Opp	Rev
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Daniel Keller	4	5	5	5	5	6	3	7	6			
Dina Izadi	5	6	6	5	6	5	4	7	6			
Dagmar Panosova	5	6	5	7	7	6	4	6	6			
Apichart Pattanapokrakarn	7	8	6	7	6	7	5	7	6			
Teparksorn pengpan	7	6	7	8	7	8	6	7	6			
Ulrike Regner	6	6	5	8	7	6	4	8	8			
Acting Team Member	Zhenyan Gong	Thiago Ross-White Be-	Toomas Liiv	Thiago Bergamaschi	Ivar Eriksson	Kehan Lu	Ivar Eriksson	Jiahong Qi	Thiago Kalife			
Rejected Problems												
Accepted Problem	9			6			15					

Signature Fight Assistant: Suntaree Double-checked with Scoring Guidelines by second Fight Assistant (signature): Jintara



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 1 Problem no.: 12

Juror: Ryo Martens Signature: \_\_\_\_\_

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Ukraine  
Eugene Wolkyh 5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Bulgaria  
Alexander Wanov 5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Slovakia  
Alexander Ukrain 5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 1 Problem no.: 12  
 Juror: CHAIWOOT Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Ukraine

Melnyk

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

6

Opp.: Bulgaria

Alexandor

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

2

Rev.: Slovakia

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reviewer $\pm 1$

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent only
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer

8

reject: 3



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 1 Problem no.: 12  
 Juror: M. H. Kwon Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Melnik 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: Alexander 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Adam 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): #3 Room: 7 Stage: 1 Problem no.: 12  
 Juror: Ramin Ruchly Signature: Ramin Ruchly

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>UA</u>	Opp.: <u>Bulgaria</u>	Rev.: <u>Stewaliq</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer
4	5	7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 1 Problem no.: 12

Juror: Ming Feng Signature: Ming Feng

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Ukraine 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Bulgaria 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Slovakia 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 1 Problem no.: \_\_\_\_\_  
 Juror: G. Jennings Signature: G. Jennings

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Ukraine

5

Melnyk Eugene

### Physics ±3

+ 1/2

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

+ 1/2

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- 1/2

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: Bulgaria

5

Alexander Ivanov

### Physics ±3

+ 1/2

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

0

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- 1/2

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Slovakia

5

### Physics ±3

+ 1

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

+ 1/2

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reviewer ±1

+ 1/2

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 2 Problem no.: 76

Juror: Ilya MARTENENKO Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Bulgaria  
Mihail Benkov 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

6

Opp.: Slovakia  
Lukoslav Gasparyk 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

8

Rev.: Ukraine  
Slava Vukobratov 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): 3 Room: 2 Stage: 2 Problem no.: 6  
 Juror: CHAINOOT Signature: Fig 12

## A report should include:

- a presentation of the appropriate concepts, theories and principles of the problem
- an explanation of the observed phenomena
- an application of appropriate mathematics
- reasonable experimental technique to gather and record data (or demonstrate the phenomena if appropriate)
- linking of theoretical and experimental findings to draw suitable conclusions
- an attempt to communicate difficult or complex ideas in an effective and understandable manner

## An opposition should show that:

- the opponent challenged the reporter's understanding of the presented concepts, theories and principles
- the opponent understood the appropriate mathematics presented
- the opponent critiqued the experimental technique used and questioned the validity of the data
- the opponent appreciated and highlighted the strengths and weaknesses of the report

## A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent
- the reviewer appreciated the important aspects (especially the controversial ones)
- the reviewer's personal opinion was in evidence (not just superficial observations)
- such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Bulgaria  
MIRKO

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

1

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

0

### Reporter $\pm 1$

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

1

Final Grade: Reporter

7

Opp.: Slavania  
MIROSLAV

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

1

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

0

### Opponent $\pm 1$

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☒ Contribution to the discussion

1

Final Grade: Opponent

7

Rev.: Ukraine  
Nikita

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

1

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

0

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

1

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

reject: 7



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 2 Problem no.: 6  
 Juror: M. H. Kwon Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: MITRO 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Mikoslav 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.:                      5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): #3 Room: 7 Stage: 2 Problem no.: 6  
 Juror: P. Reichle Signature: P. Reichle

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter** and **opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>BG</u>	Opp.: <u>SK</u>	Rev.: <u>UA</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
0.5	0	-0.5
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
0	0.5	-0.5
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
0.5	0.5	-0.5
6	6	4
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 2 Problem no.: 6  
 Juror: Ming Feng Signature: Ming Feng

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Bulgaria 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.5

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

+0.5

Final Grade: Reporter

6

Opp.: Slovakia 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.5

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+0.5

Final Grade: Opponent

6

Rev.: Ukraine 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

+0.5

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+0.5

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



Challenge problem 7, rejected  
6, accepted.

## Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 2 Problem no.: 6  
Juror: G. Jennings Signature: G. Jennings

### A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

### An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

### A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Bulgaria 5  
Mitko Benkov

Physics  $\pm 3$  +1/2

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

Presentation  $\pm 1$  +1/2

- ☒ Clear and understandable
- + ☐ Appropriate manner
- + ☐ Overall impression

Reporter  $\pm 1$  0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

7

Opp.: Slovakia 5  
Miroslav Gasparek

Physics  $\pm 3$  1

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

Presentation  $\pm 1$  1/2

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent  $\pm 1$  1/2

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Ukraine 5  
Nikita Rogovoy

Physics  $\pm 3$  +1/2

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation  $\pm 1$  -1/2

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer  $\pm 1$  +1/2

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 3 Problem no.: 14  
 Juror: Regina Karkucienė Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Slavko  
Montali  
Požičkar 5

Physics ±3  
☐ Correct and relevant physics  
☐ Scientific approach  
☐ Validity of conclusions  
☐ Accurate answers  
 +1

Presentation ±1  
☐ Clear and understandable  
☐ Appropriate manner  
☐ Overall impression  
 0

Reporter ±1  
☐ Quality of experimental technique(s)  
☐ Structure  
☐ Explanation of formulae and symbols  
☐ Appropriate models, conformity of dimensions  
☐ Slides, on-site experiments, audio, video, as appropriate  
☐ References, proper citations of ideas and input of others  
☐ Novelty of the report  
☐ Contribution to the discussion  
 +1

Final Grade: Reporter

Opp.: Ekkehard  
Eugen  
Melnyk 5

Physics ±3  
☐ Correct and relevant physics  
☐ Scientific approach  
☐ Validity of conclusions  
☐ Accurate answers  
 -1

Presentation ±1  
☐ Clear and understandable  
☐ Appropriate manner  
☒ Overall impression  
 0

Opponent ±1  
☐ Response to the reporter's solution  
☐ Shows the strong and weak points of the report  
☐ Finds shortcomings or errors in the report  
☐ Relevance of the questions  
☐ Contribution to the discussion  
 0

Final Grade: Opponent

Rev.: Bulgaria  
Alexander  
Kanov 5

Physics ±3  
☐ Correct and relevant physics  
☐ Scientific approach  
☒ Validity of conclusions  
☐ Accurate answers  
 0

Presentation ±1  
☐ Clear and understandable  
☐ Appropriate manner  
☐ Overall impression  
 0

Reviewer ±1  
☐ Provides a thorough review of report and discussion  
☐ Expresses own opinion about topics presented or discussed  
☐ Relevance of questions to both the reporter and the opponent  
☐ Draws attention to points missed by the reporter or the opponent  
 0

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: \_\_\_\_\_ Problem no.: 14  
 Juror: CHAINOOT Signature: Fegid

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Slovakia 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

Reporter ±1 1

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter 6

Opp.: Ukraine 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

Opponent ±1 0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent 5

Rev.: \_\_\_\_\_ 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

Reviewer ±1 1

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent only
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer 7



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 3 Problem no.: 14  
 Juror: M. H. Kwon Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:                      5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  +1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter  $\pm 1$  +1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.:                      5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$            

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent  $\pm 1$            

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.:                      5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation  $\pm 1$            

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer  $\pm 1$  +1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): #3 Room: 7 Stage: 3 Problem no.: 14  
 Juror: R. Reiche Signature: R. Reiche

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Slowakia 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

6

Opp.: UA 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

3

Rev.: BG 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 3 Problem no.: 14

Juror: Ming Feng Signature: Ming Feng

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Slovakia 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter  $\pm 1$  +0.5

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 6

Opp.: Ukraine 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

Presentation  $\pm 1$  0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent  $\pm 1$  0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 5

Rev.: Bulgaria 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation  $\pm 1$  0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer  $\pm 1$  0

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer 5



Challenge problem 14 accepted.

## Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 3 Problem no.: \_\_\_\_\_  
Juror: G. Jennings Signature: G. Jennings

### A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

### An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

### A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Slovakia 5  
Natalia Ruzickova

#### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

#### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

#### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Ukraine 5  
Melnyk Eugene

#### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

#### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

#### Opponent $\pm 1$

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Bulgaria 5  
Alexander Ivanov

#### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

#### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

#### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



Round: 3 Room: 7 Fight Assistants: Kanjana Suponak

	Stage 1			Stage 2			Stage 3			Stage 4		
Team	Ukraine	Bulgaria	Slovakia	Bulgaria	Slovakia	Ukraine	Slovakia	Ukraine	Bulgaria			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Ilya Martchenko	6	5	8	6	8	6	7	6	5			
Chaiwoot Boonyasiriwat	6	7	8	7	7	7	6	5	7			
Myeong Hoi Kwon	4	7	6	6	6	6	7	5	7			
Rainer Reichle	4	5	7	6	6	4	6	3	5			
Ming Feng	5	6	6	6	6	6	6	5	5			
Gavin Jennings	4	6	7	7	7	6	7	6	6			
Acting Team Member	Yevhen Melnyk	Aleksander Ivanov	Adam Urban	Mitko Benkov	Miroslav Gasparek	Mykyta Rohovyi	Natalia Ruzickova	Yevhen Melnyk	Aleksander Ivanov			
Rejected Problems	9. Artifical Muscle			7. Shaded Pole			-					
Accepted Problem	12. Thick Lens			6. Magnus Glider			14. Circle of Light					

Signature Fight Assistant:..... Double-checked with Scoring Guidelines by second Fight Assistant (signature): .....



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 1 Problem no.: 17  
 Juror: Kim Freimann Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult or complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Taiwan 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

5

Opp.: Switzerland 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Nigeria 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer

4



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 1 Problem no.: 12  
 Juror: Priscilla K. Kossow Signature: Priscilla K. Kossow

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 6

Opp.: 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 7

Rev.: 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer 7



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 1 Problem no.: 17  
 Juror: QZAN SUN Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: TW 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 5

Opp.: SW 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent ±1 0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 5

Rev.: NG 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer 6



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 1 Problem no.: 17  
 Juror: J. BALCOMBE Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: TAIWAN 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

7

Opp.: SWITZ. 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

4

Rev.: NIGERIA 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 1 Problem no.: 17  
 Juror: YE YEO Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Taiwan</u> <u>Chiu Neng-Tai</u>	Opp.: <u>Switzerland</u> <u>Phyllis Barth</u>	Rev.: <u>Nigeria</u> <u>Rebecca Bayo</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers	<input checked="" type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter <u>4</u>	Final Grade: Opponent <u>6</u>	Final Grade: Reviewer <u>5</u>

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 1 Problem no.: 17

Juror: Zakhar Maizelis Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
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- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Taiwan

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-1,5

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☐ Contribution to the discussion

0,5

Final Grade: Reporter

4

Opp.: Switzerland

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

0,5

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0,5

Final Grade: Opponent

6

Rev.: \_\_\_\_\_

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

0,5

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0,5

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 2 Problem no.: 14  
 Juror: Kim Freimann Signature: \_\_\_\_\_

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

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- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
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Rep.: Switzerland 5

### Physics ±3

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Reporter ±1

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

Opp.: Kenya 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

Rev.: Taiwan 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 2 Problem no.: 14  
 Juror: Prof. Pruet Kalasum Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories* and *principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

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- The *reporter, opponent* and *reviewer* each *start with 5 points*.
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- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:                      5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.:                      5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.:                      5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 2 Problem no.: 14  
 Juror: QIAN SUN Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial ones**)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Sun</u>	Opp.: <u>NG</u>	Rev.: <u>Tue</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reporter

4

Final Grade: Opponent

5

Final Grade: Reviewer

6



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 2 Problem no.: 14  
 Juror: J. BARCOMBE Signature: JL Bar

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
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## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
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- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
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- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: SWITZ 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reporter $\pm 1$

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☒ Contribution to the discussion

Final Grade: Reporter

6

Opp.: NIGERIA 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Opponent $\pm 1$

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

4

Rev.: TAIWAN 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reviewer $\pm 1$

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7.6



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 2 Problem no.: 14  
 Juror: YE YEO Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
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## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
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- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Switzerland  
Liopa Heimbach

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+1

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

0

Final Grade: Reporter

6

Opp.: Nigeria  
Rebecca Banjo

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

+1

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0

Final Grade: Opponent

6

Rev.: Taiwan  
Cheng Yin-chieh

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

+1

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+1

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+1

Final Grade: Reviewer

8

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 2 Problem no.: 8,14

Juror: Zakhar Maizelis Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Switzerland

5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-1,5

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☐ Contribution to the discussion

0

Final Grade: Reporter

4

Opp.: Nigeria

5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

+1

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

### Opponent ±1

- ☒ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

+0,5

Final Grade: Opponent

7

Rev.: Taiwan

5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

+0,5

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0,5

### Reviewer ±1

- ☒ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+0,5

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 3 Problem no.: 16  
 Juror: Kim Freimann Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Nigeria 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter $\pm 1$

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

3

Opp.: Taiwan 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

6

Rev.: Switzerland 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer $\pm 1$

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 3 Problem no.: 16  
 Juror: Pranav Kalasuram Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:                      5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☒ Appropriate manner
- ☐ Overall impression

Reporter ±1 0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 3

Opp.:                      5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

Presentation ±1 +1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent ±1 0

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 6

Rev.:                      5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 0

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer 2



# Scoring Guidelines

Fight (Round no.): 3 Room: 18 Stage: 3 Problem no.: 16  
 Juror: QZAN SUN Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: NG 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: TW 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: SW 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 3 Problem no.: 16  
 Juror: J. BALCOMBE Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: NIGERIA

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reporter $\pm 1$

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☒ Contribution to the discussion

3

Final Grade: Reporter

Opp.: TAIWAN

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

6

Final Grade: Opponent

Rev.: SWITZ

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation $\pm 1$

- ☒ Clear and understandable
- ☒ Appropriate manner
- ☒ Overall impression

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

6

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 3 Problem no.: 16  
 Juror: YE. YEO Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate the phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Nigeria</u> <u>Abdulkamad</u>	Opp.: <u>Taiwan</u> <u>Cheng Yun-chieh</u>	Rev.: <u>Switzerland</u> <u>Marc Bittel</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input checked="" type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input checked="" type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter <u>3</u>	Final Grade: Opponent <u>8</u>	Final Grade: Reviewer <u>7</u>

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 8 Stage: 3 Problem no.: B, H, 16  
 Juror: Zakhar Maizelis Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Nigeria

5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-1

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

### Reporter ±1

+0,5

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

5

Opp.: Taiwan

5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

### Opponent ±1

+0,5

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

7

Rev.: Switzerland

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0,5

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

0

### Reviewer ±1

+0,5

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer

6



Round: 3 Room: 8 Fight Assistants: Somchai S Jadsada

	Stage 1			Stage 2			Stage 3			Stage 4		
Team	Taiwan	Switzerland	Nigeria	Switzerland	Nigeria	Taiwan	Nigeria	Taiwan	Switzerland			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Kim Freimann (chair)	5	6	4	7	6	8	3	6	7			
Pruet Kalasuan	6	7	7	6	4	6	3	6	7			
Dian Sun	5	5	6	4	5	6	4	6	7			
John Balcombe	7	6	5	6	4	6	3	6	6			
Ye Yeo	4	6	5	6	6	8	3	8	7			
Zakhar Maizalis	4	6	6	4	7	7	5	7	6			
Acting Team Member	Neng-Tai Chiu	Phyllis Barth	Rebecca Banjo	Lioba Heimbach	Rebecca Banjo	Yin-Chieh Cheng	Abdul Samad Abdul Salam	Yin-Chieh Cheng	Marc Bitterli			
Rejected Problems				(1)			(13) (4)					
Accepted Problem	(17)			(14)			(16)					

Signature Fight Assistant: Somchai Double-checked with Scoring Guidelines by second Fight Assistant (signature): Jadsada



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 1 Problem no.: 17  
 Juror: ALAN ALLINSON Signature: Alan Allinson

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>BELARUS</u> <u>Anastasiya</u>	Opp.: <u>MACAO</u> <u>Louise</u>	Rev.: <u>RUSSIA</u> <u>Nikolay</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics	<input type="checkbox"/> Correct and relevant physics
<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach	<input type="checkbox"/> Scientific approach
<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions	<input type="checkbox"/> Validity of conclusions
<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers	<input type="checkbox"/> Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable	<input type="checkbox"/> Clear and understandable
<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner	<input type="checkbox"/> Appropriate manner
<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression	<input type="checkbox"/> Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
<input type="checkbox"/> Quality of experimental technique(s)	<input type="checkbox"/> Response to the reporter's solution	<input type="checkbox"/> Provides a thorough review of report and discussion
<input type="checkbox"/> Structure	<input type="checkbox"/> Shows the strong and weak points of the report	<input type="checkbox"/> Expresses own opinion about topics presented or discussed
<input type="checkbox"/> Explanation of formulae and symbols	<input type="checkbox"/> Finds shortcomings or errors in the report	<input type="checkbox"/> Relevance of questions to both the reporter and the opponent
<input type="checkbox"/> Appropriate models, conformity of dimensions	<input type="checkbox"/> Relevance of the questions	<input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
<input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate	<input type="checkbox"/> Contribution to the discussion	
<input type="checkbox"/> References, proper citations of ideas and input of others		
<input type="checkbox"/> Novelty of the report		
<input checked="" type="checkbox"/> Contribution to the discussion		
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer
5	6	7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Lack of control.



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 1 Problem no.: 17  
 Juror: Worasan Kundhikanya Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Belarus</u>	Opp.: <u>Macao</u>	Rev.: <u>Russia</u>
5	5	5
Physics $\pm 3$ <input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers	Physics $\pm 3$ <input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers	Physics $\pm 3$ <input type="checkbox"/> Correct and relevant physics <input type="checkbox"/> Scientific approach <input type="checkbox"/> Validity of conclusions <input type="checkbox"/> Accurate answers
-1	+1	+1
Presentation $\pm 1$ <input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input type="checkbox"/> Overall impression	Presentation $\pm 1$ <input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input type="checkbox"/> Overall impression	Presentation $\pm 1$ <input type="checkbox"/> Clear and understandable <input type="checkbox"/> Appropriate manner <input type="checkbox"/> Overall impression
0	0	0
Reporter $\pm 1$ <input type="checkbox"/> Quality of experimental technique(s) <input type="checkbox"/> Structure <input type="checkbox"/> Explanation of formulae and symbols <input type="checkbox"/> Appropriate models, conformity of dimensions <input type="checkbox"/> Slides, on-site experiments, audio, video, as appropriate <input type="checkbox"/> References, proper citations of ideas and input of others <input type="checkbox"/> Novelty of the report <input type="checkbox"/> Contribution to the discussion	Opponent $\pm 1$ <input type="checkbox"/> Response to the reporter's solution <input type="checkbox"/> Shows the strong and weak points of the report <input type="checkbox"/> Finds shortcomings or errors in the report <input type="checkbox"/> Relevance of the questions <input type="checkbox"/> Contribution to the discussion	Reviewer $\pm 1$ <input type="checkbox"/> Provides a thorough review of report and discussion <input type="checkbox"/> Expresses own opinion about topics presented or discussed <input type="checkbox"/> Relevance of questions to both the reporter and the opponent <input type="checkbox"/> Draws attention to points missed by the reporter or the opponent
0	0	+1
4	6	7
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 1 Problem no.: 17  
 Juror: ChuanYong Li Signature: ChuanYong Li

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable experimental technique to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:                      5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☒ Accurate answers

Presentation  $\pm 1$  0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter  $\pm 1$  -0.5

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter 4

Opp.:                      5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  +0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent  $\pm 1$  +0.5

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 7

Rev.:                      5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

Presentation  $\pm 1$  0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer  $\pm 1$  +1

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☒ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer 7



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 1 Problem no.: 12

Juror: Gokul Sunda Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: 5

### Physics ±3

- ☒ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Reporter ±1

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 1 Problem no.: 17  
 Juror: Tan Joo Signature: Th

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Anastasiya  
Podmazko

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach → did not
- ☐ Validity of conclusions → chose experimental
- ☐ Accurate answers if correct & relevant

-0.5

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reporter ±1

- ☐ Quality of experimental technique(s) → unclear in how measure are made & if are reliable
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-0.5

Final Grade: Reporter

4

Opp.: Louise Ong

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0

Final Grade: Opponent

5

Rev.: Nikolay  
Sibiryakov

5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

5



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 1 Problem no.: 17  
 Juror: MONSIT Signature: M. T. H. I.

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent and reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: BELARUS 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 -1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter ±1 -1

- ☐ Quality of experimental technique(s) *⇒ a constant*
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

no units. 2

Final Grade: Reporter

Opp.: MACAU 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Opponent ±1 0.5

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent 5

Final Grade: Opponent

Rev.: RUSSIA 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ±1 0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ±1 0

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer 6

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 2 Problem no: 7  
Juror: ALAN ALLISON Signature: Al Allison

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories* and *principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles* and *appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: MACAO  
Chou Hon In 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: RUSSIA  
Vitali M 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: BEARUS  
Anton R 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 2 Problem no.: 7  
 Juror: Norson Kundhikany Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem • an **explanation** of the **observed phenomena** • an **application** of **appropriate mathematics** • reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate) • linking of **theoretical** and **experimental findings** to draw **suitable conclusions** • an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles** • the opponent understood the **appropriate mathematics** presented • the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data** • the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent** • the reviewer appreciated the **important aspects** (especially the **controversial** ones) • the reviewer's **personal opinion** was in evidence (**not just superficial observations**) • such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: MaGo Reject #3, 10, 9, 8, 12  
 5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Russia  
 5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: Belarus  
 5

## Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

## Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

## Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 2 Problem no.: 7  
 Juror: Chuan Yong Li Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem • an *explanation* of the *observed phenomena* • an *application* of *appropriate mathematics* • reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate) • linking of *theoretical* and *experimental findings* to draw *suitable conclusions* • an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles* • the opponent understood the *appropriate mathematics* presented • the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data* • the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent* • the reviewer appreciated the *important aspects* (especially the *controversial* ones) • the reviewer's *personal opinion* was in evidence (*not just superficial observations*) • such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter  $\pm 1$  -1

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

4

Opp.: 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent  $\pm 1$  1

- ☒ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: 5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  +0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

Reviewer  $\pm 1$  +0.5

- ☒ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☒ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer

7



# Scoring Guidelines

Fight (Round no.): 3 Room: Q Stage: 2 Problem no.: 7  
 Juror: Goleen Naidu Signature: [Signature]

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable **experimental technique** to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:                      5

### Physics ±3

- ☒ Correct and relevant physics  
☐ Scientific approach  
☒ Validity of conclusions  
☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable  
☐ Appropriate manner  
☐ Overall impression

### Reporter ±1

- ☒ Quality of experimental technique(s)  
☐ Structure  
☐ Explanation of formulae and symbols  
☐ Appropriate models, conformity of dimensions  
☐ Slides, on-site experiments, audio, video, as appropriate  
☐ References, proper citations of ideas and input of others  
☐ Novelty of the report  
☐ Contribution to the discussion

Final Grade: Reporter

Opp.:                      5

### Physics ±3

- ☒ Correct and relevant physics  
☐ Scientific approach  
☐ Validity of conclusions  
☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable  
☐ Appropriate manner  
☒ Overall impression

### Opponent ±1

- ☒ Response to the reporter's solution  
☐ Shows the strong and weak points of the report  
☐ Finds shortcomings or errors in the report  
☐ Relevance of the questions  
☐ Contribution to the discussion

Final Grade: Opponent

Rev.:                      5

### Physics ±3

- ☒ Correct and relevant physics  
☐ Scientific approach  
☒ Validity of conclusions  
☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable  
☐ Appropriate manner  
☒ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion  
☐ Expresses own opinion about topics presented or discussed  
☐ Relevance of questions to both the reporter and the opponent  
☐ Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please **do not bend**

Final Grade: Reviewer



Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 2 Problem no.: 7  
Juror: Tan Jy Signature: Tan Jy

A report should include:

- a presentation of the appropriate concepts, theories and principles of the problem
- an explanation of the observed phenomena
- an application of appropriate mathematics
- reasonable experimental technique to gather and record data (or demonstrate the phenomena if appropriate)
- linking of theoretical and experimental findings to draw suitable conclusions
- an attempt to communicate difficult or complex ideas in an effective and understandable manner

An opposition should show that:

- the opponent challenged the reporter's understanding of the presented concepts, theories and principles
- the opponent understood the appropriate mathematics presented
- the opponent critiqued the experimental technique used and questioned the validity of the data
- the opponent appreciated and highlighted the strengths and weaknesses of the report

A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent
- the reviewer appreciated the important aspects (especially the controversial ones)
- the reviewer's personal opinion was in evidence (not just superficial observations)
- such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Chan Han In

5

Physics ±3

0

Correct and relevant physics

Scientific approach

Validity of conclusions

Accurate answers

Presentation ±1

0

Clear and understandable

Appropriate manner

Overall impression

Reporter ±1

0

Quality of experimental technique(s)

Structure

Explanation of formulae and symbols

Appropriate models, conformity of dimensions

Slides, on-site experiments, audio, video, as appropriate

References, proper citations of ideas and input of others

Novelty of the report

Contribution to the discussion

Final Grade: Reporter

5

Opp.: Vitali matunin

5

Physics ±3

0

Correct and relevant physics

Scientific approach

Validity of conclusions

Accurate answers

Presentation ±1

0

Clear and understandable

Appropriate manner

Overall impression

Opponent ±1

+1

Response to the reporter's solution

Shows the strong and weak points of the report

Finds shortcomings or errors in the report

Relevance of the questions

Contribution to the discussion

Final Grade: Opponent

6

Rev.: Anton Rusakov

5

Physics ±3

0.5

Correct and relevant physics

Scientific approach

Validity of conclusions

Accurate answers

Presentation ±1

0.5

Clear and understandable

Appropriate manner

Overall impression

Reviewer ±1

+1

Provides a thorough review of report and discussion

Expresses own opinion about topics presented or discussed

Relevance of questions to both the reporter and the opponent

Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 2 Problem no.: 7  
 Juror: MONSIT. Signature: M-Tu H.

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application of appropriate mathematics*
- reasonable *experimental technique* to *gather and record data* (or *demonstrate the phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult or complex* ideas in an *effective and understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding of concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: HACAU

5

### Physics ±3

-0.5

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

-0.5

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

4

Final Grade: Reporter

Opp.: RUSSIA

5

### Physics ±3

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

0.5

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

6

Final Grade: Opponent

Rev.: BELARUS

5

### Physics ±3

0

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

0

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

0.5

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

6

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 3 Problem no.: 8

Juror: ALAN ALLINSON Signature: Alan Allinson

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: RUSSIA  
Vitali 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  +2

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reporter  $\pm 1$  +1/2

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Opp.: BELARUS  
Anastasiya 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  -1/2

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opponent  $\pm 1$  +1/2

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

*WAS CLEARER AFTER Qs + discussion but focus on other diffusive systems.*

Final Grade: Opponent 6

Rev.: MACAO  
Philip 5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation  $\pm 1$  -

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer  $\pm 1$  -

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

*Good summary but no real input*

Final Grade: Reviewer 5

Revised after IOC feedback and approved by EC on 2011-11-03

*IS A LONG TIME SCALE*  
*viscosity, other solvents, other dissolved particles*

Final Grade: Reporter 8



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 3 Problem no.: 8  
 Juror: Worason Kundhikanjan Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories* and *principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles* and *appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Russia

5

## Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+1.5

## Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.5

## Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

0

Final Grade: Reporter

7

Opp.: Belarus

5

## Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

-0.5

## Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

-0.5

Final Grade: Opponent

4

Rev.: Macao

5

## Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

+0.5

## Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

## Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+0.5

Final Grade: Reviewer

6

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 3 Problem no.: 8  
 Juror: Chuan Yong Li Signature: Chuan Yong Li

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather** and **record data** (or **demonstrate** the **phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent and reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Russia

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.5

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

+0.2

### Reporter $\pm 1$

- ☐ Quality of experimental technique(s)
- ☒ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

+0.3

Final Grade: Reporter

6

Opp.: Belarus

5

### Physics $\pm 3$

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Opponent $\pm 1$

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0

Final Grade: Opponent

5

Rev.: Macau

5

### Physics $\pm 3$

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

+0.5

### Presentation $\pm 1$

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

+0.5

### Reviewer $\pm 1$

- ☐ Provides a thorough review of report and discussion
- ☒ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

+0.5

Final Grade: Reviewer

7

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 3 Problem no.: 8  
 Juror: Golcea Sandu Signature: [Signature]

## A report should include:

- a *presentation* of the appropriate *concepts, theories and principles* of the problem
- an *explanation* of the *observed phenomena*
- an *application* of *appropriate mathematics*
- reasonable *experimental technique* to *gather* and *record data* (or *demonstrate* the *phenomena* if appropriate)
- linking of *theoretical* and *experimental findings* to draw *suitable conclusions*
- an attempt to communicate *difficult* or *complex* ideas in an *effective* and *understandable* manner

## An opposition should show that:

- the opponent *challenged* the *reporter's understanding* of the presented *concepts, theories and principles*
- the opponent understood the *appropriate mathematics* presented
- the opponent *critiqued* the *experimental technique* used and questioned the *validity* of the *data*
- the opponent appreciated and highlighted the *strengths and weaknesses* of the report

## A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter and opponent*
- the reviewer appreciated the *important aspects* (especially the *controversial* ones)
- the reviewer's *personal opinion* was in evidence (*not just superficial observations*)
- such personal opinions were *informative, non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts, theories, principles and appropriate mathematics* used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for *physics, presentation* and for their *specific role*.
- The *reporter, opponent* and *reviewer* each *start with 5 points*.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and *write it* in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: 5

### Physics ±3

- ☒ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☒ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☒ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: 5

### Physics ±3

- ☐ Correct and relevant physics
- ☒ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☒ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report
- ☒ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

Rev.: 5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☒ Validity of conclusions
- ☒ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 3 Problem no.: 8  
Juror: Tan Jy Signature: Thy

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application of appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult or complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding of concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Vitali

Nathan

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

6

Opp.: Anastasi

Pochmar

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

4

Rev.: Philip

Noelker

Plagutin

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



# Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 3 Problem no.: 8  
 Juror: MONSIT. Signature: M. T...

## A report should include:

- a **presentation** of the appropriate **concepts, theories and principles** of the problem
- an **explanation** of the **observed phenomena**
- an **application** of **appropriate mathematics**
- reasonable experimental technique to **gather and record data** (or **demonstrate the phenomena** if appropriate)
- linking of **theoretical** and **experimental findings** to draw **suitable conclusions**
- an attempt to communicate **difficult** or **complex** ideas in an **effective** and **understandable** manner

## An opposition should show that:

- the opponent **challenged** the **reporter's understanding** of the presented **concepts, theories and principles**
- the opponent understood the **appropriate mathematics** presented
- the opponent **critiqued** the **experimental technique** used and questioned the **validity** of the **data**
- the opponent appreciated and highlighted the **strengths and weaknesses** of the report

## A review should show that:

- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and opponent**
- the reviewer appreciated the **important aspects** (especially the **controversial** ones)
- the reviewer's **personal opinion** was in evidence (**not just superficial observations**)
- such personal opinions were **informative, non-trivial** and demonstrated, where possible, the reviewer's **understanding** of **concepts, theories, principles and appropriate mathematics** used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for **physics, presentation** and for their **specific role**.
- The **reporter, opponent** and **reviewer** each **start with 5 points**.
- Consider the following **suggestions** to **add** to or **deduct** from the initial **5 points**.
- Select each partial grade from each section and **write it** in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Russia

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

1

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0.5

### Reporter ±1

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

0.5

Final Grade: Reporter

7.

Opp.: BE LARUS

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Opponent ±1

- ☐ Response to the reporter's solution
- ☐ Shows the strong and weak points of the report
- ☐ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

0

Final Grade: Opponent

5

Rev.: MACAU.

5

### Physics ±3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

0

### Presentation ±1

- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

0

### Reviewer ±1

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

0

Final Grade: Reviewer

5

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend



Round: 3 Room: 9 Fight Assistants: .....

	Stage 1			Stage 2			Stage 3			Stage 4		
Team	Belarus	Macao	Russia	Macao	Russia	Belarus	Russia	Belarus	Macao			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Alan Allinson (chair)	5	6	7	4	5	6	8	6	5			
Worason Kundhikanjana	4	6	7	3	4	5	7	4	6			
Chuan Yong Li	4	7	7	4	6	7	6	5	7			
Sandu Mirel Galcea	3	4	5	4	5	6	5	4	6			
Joy Tan	4	5	5	5	6	7	6	4	5			
Monsit Tanasittikosol	2	5	6	4	6	6	7	5	5			
Acting Team Member	Anastasiya Podmazko	Louise Ung	Nikolay Sibiryaev	Chou Hon In	Vitalii Matiunin	Anton Rusanov	Vitalii Matiunin	Anastasiya Podmazko	Philip Naderex Lagmitan			
Rejected Problems	1			3, 10, 9, 8, 12			4, 11, 12					
Accepted Problem	17			7			8					

Signature Fight Assistant: ..... Double-checked with Scoring Guidelines by second Fight Assistant (signature): .....