

Scoring Guidelines

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

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.: Thailand 5
Pepca

Physics ± 3 -2
some

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

Presentation ± 1 +1

- Clear and understandable
- Appropriate manner *✓*
- Overall impression

Reporter ± 1 0

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

Final Grade: Reporter 4

Opp.: NZ 5
Howell Fu

Physics ± 3 +1

- 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 *as*
- Shows the strong and weak points of the report *some*
- Finds shortcomings or errors in the report
- Relevance of the questions *not present*
- Contribution to the discussion

Final Grade: Opponent 7

Rev.: Sweden 5
Peter Wehlin

Physics ± 3 +2

- 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 *with*
- 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.): 2 Room: D Stage: 1 Problem no.: 2

Juror: Carsten Gecheler Signature: [Signature]

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Rep.: Thailand 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

0

Final Grade: Reporter

4

Opp.: New Zealand 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.: Sweden 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

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

9

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.): 2 Room: D Stage: 1 Problem no.: 2

Juror: Naveen Kishore Signature: Sulal

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- 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

Physics ±3

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

-

Physics ±3

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

+1

Physics ±3

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

+1

Presentation ±1

- Clear and understandable
- Appropriate manner
- Overall impression

Presentation ±1

- Clear and understandable
- Appropriate manner
- Overall impression

-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
- 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

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

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: Reporter

3

Final Grade: Opponent

8

Final Grade: Reviewer

7

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Scoring Guidelines

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

Juror: Imanora Palcott Signature: Imanora Palcott

A report should include:

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- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
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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

5

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

5

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

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.): 1 Room: D Stage: 2 Problem no.: 2

Juror: Roh Capuder Signature: [Signature]

- A report should include:**
- a **presentation** of the appropriate **concepts, theories and principles** of the problem
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 - 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**
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- the reviewer succeeded in giving an **objective summary** of the performances the **reporter and 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.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Thailand
Peera 5

Opp.: New Zealand
Howell Fu 5

Rev.: Sweden
Peter Whelley 5

Physics ±3 -1

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

Physics ±3 0

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

Physics ±3 0

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

Presentation ±1 0

- Clear and understandable
- Appropriate manner
- Overall impression

Presentation ±1 1

- Clear and understandable
- Appropriate manner
- Overall impression

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

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

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: Reporter 4

Final Grade: Opponent 6

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.): 2 Room: D Stage: 1 Problem no.: 2

Juror: Dina Ixadi Signature: Izaadif

A report should include:

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- an attempt to communicate **difficult or complex** ideas in an **effective and understandable** manner

An opposition should show that:

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- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Thailand 5

Peera

Physics ±3

-1.5

- 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

Final Grade: Reporter

4

Opp.: New Zealand 5

Howell Fu

Physics ±3

1.25

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

Presentation ±1

0.5

- Clear and understandable
- Appropriate manner
- Overall impression

Opponent ±1

0.25

- 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.: Sweden 5

Petter Aohlin

Physics ±3

1.5

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

Presentation ±1

0.25

- Clear and understandable
- Appropriate manner
- Overall impression

Reviewer ±1

0.25

- 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.): 2 Room: D Stage: 2 Problem no.: 16

Juror: Alan Aclinson Signature: Alan Aclinson

A report should include:

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- 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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Rep.: NZ 5
Matthew H

Physics ± 3 2

- Correct and relevant physics
- Scientific approach *yes but not be good*
- 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.: Sweden 5
Fredrick Sjavall

Physics ± 3 0

- 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.: Thailand 5
Thanakorn

Physics ± 3 +1

- Correct and relevant physics
- Scientific approach
- Validity of conclusions *wall*
- 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

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: D Stage: 2 Problem no.: 16

Juror: Carsten Geddes Signature: Seelan

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Rep.: New Zealand
(Matthew Harvey) 5

Physics ± 3 0

- 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.: Sweden 5

Physics ± 3 +1

- 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 7

Rev.: Thailand 5

Physics ± 3 +1

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

Presentation ± 1 ~~0~~ 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

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Final Grade: Reviewer ~~5~~ 6

Scoring Guidelines

Fight (Round no.): 2 Room: D Stage: 2 Problem no.: _____

Juror: Nancy Horvack Signature: [Signature]

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 - 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 +1

- 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.: _____ 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

- 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.: _____ 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 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.): 2 Room: D Stage: 2 Problem no.: 16
 Juror: Zsuzsanna Rajerich Signature: Abakorn

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

-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
- 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.: _____ 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

+1

Rev.: _____ 5

Physics ±3

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

+1

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

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

4.5

Final Grade: Opponent

6

Final Grade: Reviewer

7

Scoring Guidelines

Fight (Round no.): 2 Room: D Stage: 2 Problem no.: 16

Juror: Roly Capuda Signature: Cof

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.: Yon Edvard
4 with Koway 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

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.: Sunder
Fredrik Sjorvall 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

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

1/2

Rev.: Thailand 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

- 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

45

Scoring Guidelines

Fight (Round no.): 2 Room: D Stage: 2 Problem no.: 16

Juror: Dina Izadi Signature: D Izadi

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

Matthew

Physics ±3

+1.25

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

Presentation ±1

-0.25

- 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.: Sweden 5

Fredrik

Physics ±3

+0.25

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

Presentation ±1

-0.25

- 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.: Thailand 5

Thanakorn

Physics ±3

-0.25

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

Presentation ±1

-0.75

- 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

4

Scoring Guidelines

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

Juror: Alan Atkinson Signature: Alan Atkinson

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
Marica 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

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.: Thailand
Angsumalee 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

5

Rev.: NZ
Jesse Zhang 5

Physics ± 3 0

- 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

7

Scoring Guidelines

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

Juror: Carsten Geckeler 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
Mania Anghol

Physics ±3 -1

- 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 5

Opp.: Thailand 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

- 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.: New Zealand 5

Physics ±3 +0.5

- 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 7

Scoring Guidelines

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

Juror: Anna Marshall Signature: La Vall

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

3

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

3

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

6

Scoring Guidelines

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

Juror: Zusman Rajend Signature: Zusman Rajend

- 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 -1

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

Presentation ±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 5

Opp.: _____ 5

Physics ±3 -1

- 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.: _____ 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

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: D Stage: 2 Problem no.: 1
 Juror: R. Capider 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
Maria Angd 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** 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 4.3

Opp.: Thailand
Aungundee 5

- Physics ±3** 00
- 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 4

Rev.: New Zealand
Jesse Zhang 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**
- 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.): 2 Room: D Stage: 3 Problem no.: 1

Juror: Dina Szadi 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

Maria -1.25

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.: Thailand 5

Aung Sumalee -2.25

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.: New Zealand 5

Jesse 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

6