

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.: Henry Jay 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:

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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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- the opponent understood the appropriate mathematics presented
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- the opponent appreciated and highlighted the strengths and weaknesses of the report

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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.
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Rep.: Hungary Singapore 5

Physics ± 3 +0.8

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

Presentation ± 1 +0.5

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

Reporter ± 1 -0.1

- ☐ 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.: Czech 5

Physics ± 3 -0.5

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

Presentation ± 1 -0.2

- ☐ 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 4

Rev.: Singapore Hungary 5

Physics ± 3 +1

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

Presentation ± 1 +0.1

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

Reviewer ± 1 +0.3

- ☐ 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 7

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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:

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- an explanation of the observed phenomena
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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 +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

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Final Grade: Reviewer

8

Scoring Guidelines

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

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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

Final Grade: Reviewer 6

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Scoring Guidelines

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

Juror: Kerry Parker Signature: [Signature]

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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.
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Rep.: Tina Banerjee

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

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.: Pavla Běsina

Czech Rep.

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

4

Rev.: Shen Yu Jun

Singapore

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

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

7

Scoring Guidelines

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

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- an explanation of the observed phenomena
- an application of appropriate mathematics
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- 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
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- the opponent appreciated and highlighted the strengths and weaknesses of the report

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- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent
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- the reviewer's personal opinion was in evidence (not just superficial observations)
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- Consider the following suggestions to add to or deduct from the initial 5 points.
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Rep.: HU 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.: CZ 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.: SP 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

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]

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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Rep.: Geek 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 4

Opp.: Singapore 5

Physics ± 3

- ☐ 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.: Henry ang 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 6

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Scoring Guidelines

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

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- an explanation of the observed phenomena
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Rep.: Czech 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

Final Grade: Reporter 6

Opp.: Singapore 5

Physics ± 3 +1.3

- ☐ 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 -0.4

- ☐ 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

Final Grade: Reviewer 4

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Scoring Guidelines

Fight (Round no.): 3 Room: 1 Stage: 2 Problem no.: 4 circle of light
 Juror: Sureerat Homhuan Signature: Sureerat Homhuan

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- 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

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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.: 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

4

Opp.: 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

4

Rev.: 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

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.: 14
 Juror: LARS GILLES 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 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.: 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

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

- ☐ 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: 1 Stage: 2 Problem no.: 14
 Juror: Kerry Parker Signature: Ken B.

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 Bérsová

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 Yui Tse

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.: Alex Biro

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: Kwang 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.: 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 +2½

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

Presentation ± 1 +½

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

Reporter ± 1 +½

- ☒ 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.: Myanmar 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 +½

- ☒ 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 -½

- ☐ 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
 Junor: 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

- ☐ 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

+2.4

+0.2

+0.3

Final Grade: Reporter

8

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

+2

+0

0

Final Grade: Opponent

7

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

-0.5

0.3

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: 1 Stage: 3 Problem no.: B Magnetic pendulum
 Junor: 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

+2.5

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

+0.5

Final Grade: Reporter

9

Opp.: 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

-

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.: 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

-

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: Lars G. Sørensen Signature: Lars G. Sørensen

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

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: 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 ± 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 +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.: HR 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 7

Rev.: CZ 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

Round: 3 Room: 1 Fight Assistants: Mr. Korsuo Pasaway, Mr. Thawndon Kongnok

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Hungary	Czech Rep.	Singapore	Czech Rep.	Singapore	Hungary	Singapore	Hungary	Czech Rep.	Rep	Opp	Rev
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Samuel Ryland (Chair)	4	5	7	4 ⁴	7 ⁷	6	9	7	5			
Michael F. Smith	6	4	7	6	7 ⁷	4	8	7	5			
Screenrat Homkuan	5	2	8	4	7 ⁷	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			
Kwang Joo Kim	6	6	8	6	6	5	7	7	6			
Acting Team Member	Tina	Paula Kovessova	Yu Jun Shen	Dula Kovessova	Yu Tse Lee	A'kos	KOH JIN MING	Andros Lauko	PAVEL			
Rejected Problems												
Accepted Problem	10 Singing Blades of Grass			1A Circle of Light			13 Magnetic Pendulum					

Signature Fight Assistant: Mikael Korsuo Double-checked with Scoring Guidelines by second Fight Assistant (signature): Thawndon Kongnok

Scoring Guidelines

Fight (Round no.): 11 Room: 2 Stage: 1 Problem no.: 10
 Juror: M. G. G. G. G. 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 0.4

- ☐ 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

Opp.: 5

Physics ± 3 +1.2

- ☐ 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

Rev.: 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

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 Kanchanapuchit 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 ± 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.: 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

7

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

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: 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 ± 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.: KO 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.: 05 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 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: 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 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 6

Opp.: Korea 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.: USA 5

Physics ± 3

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

Presentation ± 1 0,2

- ☒ 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 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: 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*
- ☐ Structure *(or not shown if it was)*
- ☒ 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 Beon 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.: Garry 5

Physics ± 3 +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: A. K. Guldjiev 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 +0.2

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

Reporter ± 1 +0.6

- ☐ 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 +0.6

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

Opponent ± 1 +0.6

- ☐ 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 +0.6

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

Reviewer ± 1 +0.6

- ☐ 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: 2 Stage: 2 Problem no.: 1
 Juror: Witaya Kancharapuskat Signature: Witaya

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

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

0

Final Grade: Reporter

7

Opp.: USA

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.: Germany

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

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.): 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 ± 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.: US 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.: GE 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: 2 Problem no.: 7
 Juror: Julian Renardier Signature: J. Renardier

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

2

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

Presentation ± 1

0

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

Reporter ± 1

0.2

- ☒ 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

-1

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

Presentation ± 1

0

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

Opponent ± 1

0.2

- ☒ 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

1

- ☐ 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

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.: 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

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

-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

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.: Germany
Ann-Kathrin Raab

5

Physics ±3

+1 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

+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: 2 Problem no.: 1
 Juror: Matthew 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 +2.5

- ☐ 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 8

Opp.: USA 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

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.: 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

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 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: Nguldjev 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

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: 3 Problem no.: 14
 Juror: Wittaya Konchanapant 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 0

- ☐ 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

4

Opp.: Germany 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

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.: Korea 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

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

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.: GI 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 Renacher 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 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 -0.4

- ☐ 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 3

Opp.: 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

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.: Korea 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

Reviewer ± 1 0.8

- ☒ 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: 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

- ☐ 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

4

Opp.: Germany
Ann-Kathrin Raab

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.: Korea
Ahn Cheong-Eung

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

+1/2

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: Mattias Andersson Signature: MA.

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 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.: 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

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 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

Round: 3 Room: 2 Fight Assistants: Kennakorn Abnong / Jiraporn Saengjoe

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
Assem Kyuldjiev	6	8	8	7	7	7	3	6	6			
Nittaya Kanchanapusanit	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: Kennakorn Abnong Double-checked with Scoring Guidelines by second Fight Assistant (signature): Jiraporn Saengjoe

Scoring Guidelines

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

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

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

7

Opp.: AUSTRIA

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.: 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

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.: Poland 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.: Austria 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.: 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

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 Ullrich Signature: Felicia Ullrich

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
Radost Ustakiewicz

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
Delell 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
Kelvin 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: Vimoshchenko 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.
- 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: Patrick 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 0

- ☐ 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 0

- ☐ 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 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

5

Scoring Guidelines

Fight (Round no.): 3 Room: 3 Stage: 1 Problem no.: 6
 Juror: Samchate Loukumvong Signature: Sam Louk

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 ± 3

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

Presentation ± 1 +1

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

Reporter ± 1 +0.5

- ☐ 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.: AUSTRALIA 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

6

Rev.: POLAND 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

9

Scoring Guidelines

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

Opp.: Australia 5

Physics ± 3 6

- ☐ 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.: Poland 5

Physics ± 3 +1.5

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

Presentation ± 1 +1

- ☒ 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 8

Scoring Guidelines

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

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 Winkler

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.: Austria
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 Wajda

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: Vimoshchenko 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
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ 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 Nany 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>
5	5	5
0	0	+0.5
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☒ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☒ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter <u>6</u>	Final Grade: Opponent <u>6</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: 2 Problem no.: 12
 Juror: S. Limkyumwong 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
0	0	1
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
1	0	1
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: KUANDRAN Signature: Mercedes

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

-2.5

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

+0.5

Final Grade: Reporter

4

Opp.: 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

+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

8

Rev.: AUSTRIA

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

-0.5

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: 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.: 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

3

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

6

Rev.: Austria

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: 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 -1

- ☐ 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

3

Opp.: Poland
Endre Wyszynski 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.: Australia
Markus Riese 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

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.): 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	Physics ± 3	Physics ± 3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter <u>3</u>	Final Grade: Opponent <u>8</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: 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
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter <u>4</u>	Final Grade: Opponent <u>7</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: 3 Stage: 3 Problem no.: 7
 Juror: S. Limkuwong 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>Australia</u>	Opp.: <u>Poland</u>	Rev.: <u>Australia</u>
5	5	5
0	3	2
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☒ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☒ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ 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

Round: 3 Room: 3 Fight Assistants: Jon Jatimaosik ; Rojnapa Thararas

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	POL	AUT	AUS				AUS	POL	AUT			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
František Kundrác	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			
Lat Neng Chan	7	6	5	6	6	7	4	7	6			
Sorachate 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: Jon Jatimaosik Double-checked with Scoring Guidelines by second Fight Assistant (signature): Rojnapa Thararas



Scoring Guidelines

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

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>Dr. Brit</u>	Opp.: _____	Rev.: _____
5	5	5
Physics ± 3	Physics ± 3	Physics ± 3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter <u>5</u>	Final Grade: Opponent <u>6</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: 4 Stage: 1 Problem no.: 13
 Juror: SUE NARER Signature: S. Narer

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 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 good
- ☐ Structure NA really
- ☐ Explanation of formulae and symbols NA really
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate NA given
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Thailand 5
Pawakapan

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 5
Majid Bak

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: POHORET, MINA 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 ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	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
Presentation ±1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	Presentation ±1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	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	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
6	5	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: 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
☒ Correct and relevant physics	☒ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☒ Clear and understandable	☒ Clear and understandable	☒ Clear and understandable
☒ Appropriate manner	☒ Appropriate manner	☒ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
☐ Quality of experimental technique(s)	☒ Response to the reporter's solution	☒ Provides a thorough review of report and discussion
☐ Structure	☒ Shows the strong and weak points of the report	☒ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☒ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☒ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
4	6	6
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: 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
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☒ Scientific approach	☒ Scientific approach	☒ Scientific approach
☒ Validity of conclusions	☒ Validity of conclusions	☒ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☒ Clear and understandable	☒ Clear and understandable	☒ Clear and understandable
☒ Appropriate manner	☒ Appropriate manner	☒ Appropriate manner
☒ Overall impression	☒ Overall impression	☒ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☒ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter 5	Final Grade: Opponent 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: 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.: UK 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.: Thailand 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.: Iran 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: 4 Stage: 2 Problem no.: 16
 Juror: Uld 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: D'NEILL Signature: A90/Mull

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 +2

- ☒ 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 4

Opp.: IRAN 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.: UK 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

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: 4 Stage: 2 Problem no.: 16
 Juror: Hung-Chih Kuo Signature: He-16

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>
5	5	5
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☒ Scientific approach	☐ Scientific approach	☒ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☒ Validity of conclusions
☐ Accurate answers	☒ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☒ Clear and understandable	☒ Clear and understandable	☐ Clear and understandable
☒ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☒ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☒ Quality of experimental technique(s)	☐ Response to the reporter's solution	☒ Provides a thorough review of report and discussion
☒ Structure	☒ Shows the strong and weak points of the report	☒ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☒ Finds shortcomings or errors in the report	☒ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☒ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
4	5	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: 4 Stage: 2 Problem no.: 16

Juror: H. HOSSEINI, M. HOSSEINI 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

0

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

Scoring Guidelines

Fight (Round no.): 3 Room: 4 Stage: 3 Problem no.: 16
 Juror: SUE NARIER Signature: Sue Nari

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.: Perthar 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.: Amalita 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.: Don 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: 4 Stage: 2 Problem no.: _____
 Junor: Lobyshev Signature: Mark

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
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter <u>4</u>	Final Grade: Opponent <u>6</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: 4 Stage: 3 Problem no.: 1
 Juror: Lobyshev Signature: Kho

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>5</u>	Opp.: <u>5</u>	Rev.: <u>5</u>
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	Physics ±3 ☐ Correct and relevant physics ☐ Scientific approach ☒ Validity of conclusions ☐ Accurate answers
Presentation ±1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	Presentation ±1 ☐ Clear and understandable ☐ Appropriate manner ☒ Overall impression	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	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 <u>8</u>	Final Grade: Opponent <u>6</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: 4 Stage: 3 Problem no.: 1
 Junor: 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.: Analysis 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 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. MORGAN & M. KELLY 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>IRPW</u>	Opp.: <u>UK</u>	Rev.: <u>H. MORGAN & M. KELLY</u>
5	5	5
0	+1	0
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
-1	+1	0
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
4	7	5
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: 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
☐ Correct and relevant physics	☒ Correct and relevant physics	☒ Correct and relevant physics
☐ Scientific approach	☒ Scientific approach	☒ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☒ Clear and understandable	☐ Clear and understandable	☒ Clear and understandable
☐ Appropriate manner	☒ Appropriate manner	☒ Appropriate manner
☐ Overall impression	☒ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
☐ Quality of experimental technique(s)	☒ Response to the reporter's solution	☒ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☒ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☒ Finds shortcomings or errors in the report	☒ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ 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 1011-11-03

Scoring Guidelines

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

Juror: A'NEILL Signature: PJO Mill

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

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			
Mihailo Homostaei	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	Chosel Nangthak	Donithan Jeevaree 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 Powder			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 ± 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.: Dimitrie

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

misunderstood core aspects of his presentation

Final Grade: Opponent

5

Rev.: Ivugh

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

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

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>Naw Z</u>	Opp.: <u>Ro</u>	Rev.: <u>Kenya</u>
5	5	5
0	0	-1
Physics ± 3	Physics ± 3	Physics ± 3
☒ Correct and relevant physics	☒ Correct and relevant physics	☐ Correct and relevant physics
☒ Scientific approach	☐ Scientific approach	☐ Scientific approach
☒ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☒ Clear and understandable	☒ Clear and understandable	☒ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
☐ Quality of experimental technique(s)	☒ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☒ Structure	☒ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☒ Explanation of formulae and symbols	☒ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☒ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
5	5	3
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: 5 Stage: 1 Problem no.: 9
 Juror: Andres Velez 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.: New Zealand

5

Jack Tregidga

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

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 Mitile

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

4

Rev.: Kenya

5

[Signature]

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

-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

2

Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 1 Problem no.: 9
 Juror: STANISLAV PAULOS 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.: NEW ZEALAND 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

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
- ☒ Graphs

Final Grade: Reporter

6

Opp.: ROMANIA 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.: KENYA 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

5

Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 1 Problem no.: 9

Juror: Gina E. Kner Signature: Mig

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 Takahashi 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.: <u>Alex Roman</u>	Opp.: <u>Xiong Kanya</u>	Rev.: <u>Nith N2</u>
5	5	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	Physics ± 3 ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers
Presentation ± 1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	Presentation ± 1 ☒ Clear and understandable ☐ Appropriate manner ☐ Overall impression	Presentation ± 1 ☐ Clear and understandable ☒ Appropriate manner <i>don't yell</i> ☐ 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	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 <u>3</u>	Final Grade: Opponent <u>2</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.: 1b
 Junior: Niryt Signature: Niryt

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

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.: Panama

5

Alexandro B. Adur

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

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

Opp.: Kenya

5

Xiang Zhuang

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

Rev.: New Zealand

5

Nicholas Lam

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

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

3

Final Grade: Opponent

2

Final Grade: Reviewer

7

Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 2 Problem no.: 16
 Juror: STANISLAV PRAVOS 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.: 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

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.: 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

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

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

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: 2 Problem no.: 16

Juror: Atina Bener 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.: Kenz

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

-2

Final Grade: Reporter

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.: Romania

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
☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 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	☐ 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	☐ 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 <u>3</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: 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
Xiang Zhuang

5

Physics ± 3

-2

- ☐ 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

1

Opp.: New Zealand
Mathew Poudel

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

+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.: Romana
Anca Goldis

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

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

67

Scoring Guidelines

Fight (Round no.): 3 Room: 5 Stage: 3 Problem no.: 8
 Juror: STANISLAW PAWLO Signature: Pawlo

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: Günce Eker 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.: Kenja 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

Opp.: NZ 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.: Ro 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

Round: 3 Room: 5 Fight Assistants: Wanchalaen Pansangant, 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			
Nirnt 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	Inga Wanjau	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 Pansangant 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 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 4

Opp.: Brazil 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.: 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

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: 6 Stage: 1 Problem no.: 9

Juror: Dina Ixadi Signature: A. Zaidi

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.: Chen 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

Opp.: Thiago Bezerra
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

Rev.: Tomas Ny
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

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: PAOLONA' DAEAR 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: A6 Stage: Problem no.: 9 (Hoxerhoff)
 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 ± 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.: Brazil
(Thiago)

5

Physics ± 3

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

+2

Presentation ± 1

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

0.5

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

8

Rev.: Sweden
(Thomas)

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

+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: PENG PAN Signature: T. Tengan

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 ± 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

1

Final Grade: Reporter

7

Opp.: BR

5

Physics ± 3

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

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.: SE

5

Physics ± 3

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

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

1.5

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: 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.: Sri Lanka
Saman Jayasinghe

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

- ☐ 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.: Schweden 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.: 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

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 Iradi 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

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

0

Final Grade: Reporter

5

Opp.: Ivar
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

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.: Keihan
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

+0.5

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

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.): 10 Room: 6 Stage: 10 Problem no.: 6
 Juror: PAULSON JAMES Signature: Paul

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.: Bruno

5

Physics ± 3

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

+2

Presentation ± 1

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

-1/2

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

+0

Final Grade: Reporter

7

Opp.: Sundar

5

Physics ± 3

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

+2

Presentation ± 1

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

+1/2

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

Final Grade: Opponent

7

Rev.: Chinua

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: 1st 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>)	5	Opp.: <u>Sweden</u> (<u>Ivar</u>)	5	Rev.: <u>China</u> (<u>Ke Han</u>)	5
Physics ± 3	+1	Physics ± 3		Physics ± 3	+1
☐ Correct and relevant physics		☐ Correct and relevant physics		☐ Correct and relevant physics	
☐ Scientific approach		☐ Scientific approach		☐ Scientific approach	
☐ Validity of conclusions		☐ Validity of conclusions		☐ Validity of conclusions	
☐ Accurate answers		☐ Accurate answers		☐ Accurate answers	
Presentation ± 1	0.5	Presentation ± 1		Presentation ± 1	0.5
☐ Clear and understandable		☐ Clear and understandable		☐ Clear and understandable	
☐ Appropriate manner		☐ Appropriate manner		☐ Appropriate manner	
☐ Overall impression		☐ Overall impression		☐ Overall impression	
Reporter ± 1	0.5	Opponent ± 1	+1	Reviewer ± 1	0.5
☐ Quality of experimental technique(s)		☐ Response to the reporter's solution		☐ Provides a thorough review of report and discussion	
☐ Structure		☐ Shows the strong and weak points of the report		☐ Expresses own opinion about topics presented or discussed	
☐ Explanation of formulae and symbols		☐ Finds shortcomings or errors in the report		☐ Relevance of questions to both the reporter and the opponent	
☐ Appropriate models, conformity of dimensions		☐ Relevance of the questions		☐ Draws attention to points missed by the reporter or the opponent	
☐ Slides, on-site experiments, audio, video, as appropriate		☐ Contribution to the discussion			
☐ References, proper citations of ideas and input of others					
☐ Novelty of the report					
☐ Contribution to the discussion					
Final Grade: Reporter	7	Final Grade: Opponent	6	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: 2 Problem no.: _____

Juror: PENSIAN Signature: T. Pangpan

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 ☒ Correct and relevant physics ☒ Scientific approach ☒ Validity of conclusions ☒ Accurate answers	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
Presentation ± 1 ☒ Clear and understandable ☒ Appropriate manner ☒ Overall impression	Presentation ± 1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	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	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
8	7	8
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: 6 Stage: 2 Problem no.: 6
 Juror: REAGER Signature: Reager

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
Thiago R. Gomes

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

+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

8

Opp.: Saudi
Ivan Eriksson

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

+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

+0.5

Final Grade: Opponent

7

Rev.: Rina
Michael L. V.

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.): 3 Room: 6 Stage: 3 Problem no.: 15
 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.: 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.: Spain 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 Ikadi Signature: A. Zodijs

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

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.): 14 Room: 6 Stage: 10 Problem no.: 15
 Juror: PRANJANA DACHAR 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.: Sri Lanka

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.: Brunei

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

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.: 15 Gravity hook
 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: PENG PAN Signature: T. Tengpan

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 ± 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

-

Final Grade: Reporter

6

Opp.: CN

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

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.: BR

5

Physics ± 3

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

-

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

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: 3 Problem no.: 15
 Juror: RECNER Signature: Nequn

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 Ericson

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.: Anna
Yuehng 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
Liang Halfe

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 Rep	Brazil Opp	Sweden Rev	Brazil Rep	Sweden Opp	China Rev	Sweden Rep	China Opp	Brazil Rev	Rep	Opp	Rev
Juror												
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 Pattanapokabon	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): Jinlara

Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 1 Problem no.: 12
 Juror: Rya Martenev 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
Eugene Mathys 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

0

Final Grade: Reporter

6

Opp.: Bulgaria
Alexander Wanov 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.: Slovakia
Alain Urban 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

+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

8

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 ± 3

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

Presentation ± 1

- 6
- ☐ 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.: Bulgaria

Alexander

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

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.: Slovakia

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

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

8

Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 1 Problem no.: 12
 Junor: M. H. Kwon Signature: Zumy

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>Melnik</u>	Opp.: <u>Alexander</u>	Rev.: <u>Adam</u>
5	5	5
Physics ± 3	Physics ± 3	Physics ± 3
0	+1	0
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
0	0	+1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
-1	+1	0
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter 4	Final Grade: Opponent 7	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 Roshdy Signature: Ramin Roshdy

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>Slowakia</u>
5	5	5
Physics ± 3 <u>+0.5</u>	Physics ± 3 <u>0.5</u>	Physics ± 3 <u>0</u>
☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers
Presentation ± 1 <u>0</u>	Presentation ± 1 <u>-1</u>	Presentation ± 1 <u>1</u>
☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression
Reporter ± 1 <u>-1</u>	Opponent ± 1 <u>0.5</u>	Reviewer ± 1 <u>+1</u>
☐ 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	☐ 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	☐ 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 <u>4</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: 7 Stage: 1 Problem no.: 12
 Juror: Ming Fong Signature: Ming Fong

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

$+\frac{1}{2}$

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

Presentation ± 1

$+\frac{1}{2}$

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

Reporter ± 1

$-\frac{1}{2}$

- ☒ 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

$+\frac{1}{2}$

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

Presentation ± 1

0

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

Opponent ± 1

$-\frac{1}{2}$

- ☒ 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

Rev.: Slovakia

Physics ± 3

$+\frac{1}{2}$

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

Presentation ± 1

$+\frac{1}{2}$

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

Reviewer ± 1

$+\frac{1}{2}$

- ☒ 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: Kyō MARTENKO 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 ± 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

Opp.: Slovakia
Miroslav Gaspár 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 +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.: Ukraine
Slava Vitya 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 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

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.: 6
 Juror: CHAINOUT 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
MILKO

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.: Slovakia
MIROSLAV

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.: Ukraine
Nikita

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: 7 Stage: 2 Problem no.: 6
 Junor: 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 ± 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

- ☐ 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.: Mikoslav 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

6

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

- ☐ 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: 2 Problem no.: 6
 Juror: R. Reichle Signature: R. 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>MA</u>
5	5	5
Physics ± 3 <u>0.5</u>	Physics ± 3 <u>0</u>	Physics ± 3 <u>-0.5</u>
☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers
Presentation ± 1 <u>0</u>	Presentation ± 1 <u>0.5</u>	Presentation ± 1 <u>-0.5</u>
☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression
Reporter ± 1 <u>0.5</u>	Opponent ± 1 <u>0.5</u>	Reviewer ± 1 <u>-0.5</u>
☐ 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	☐ 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	☐ 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 <u>6</u>	Final Grade: Opponent <u>6</u>	Final Grade: Reviewer <u>3.4</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: 7 Stage: 2 Problem no.: 6
 Juror: Ming Fung Signature: Ming Fung

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

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.: Slovakia 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.: Ukraine 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

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 ± 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 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

Opp.: Slovakia 5
Miroslav Gasparik

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 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

Rev.: Ukraine 5
Nikita Rogovoy

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

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

Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 3 Problem no.: 14
 Juror: Beyza Kaptan 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.: Slowkin
Natalia
Pozichova

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

7

Opp.: Ukraine
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

6

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

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: 4 Stage: _____ Problem no.: 14
 Juror: CHAINWOT 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.: Slovakia

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

1

Final Grade: Reporter

6

Opp.: Ukraine

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

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 only
- ☐ 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

7

Scoring Guidelines

Fight (Round no.): 3 Room: 7 Stage: 3 Problem no.: 14
 Juror: M. H. Kwong 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
		+1
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
+1		
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
+1		+1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ 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

Final Grade: Opponent

Final Grade: Reviewer

Revised after IOC feedback and approved by EC on 2013-11-03

Scoring Guidelines

Fight (Round no.): #3 Room: 7 Stage: 3 Problem no.: 14
 Juror: R. Rendle Signature: R. Rendle

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

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

Presentation ± 1 0

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

Reporter ± 1 +0.5

- ☐ 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 ± 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.: Bulgaria 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: 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
Natalia Ruzickova

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

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

Opp.: Ukraine
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

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

Rev.: Bulgaria
Alexander Ivanov

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

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

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: 7 Fight Assistants: Kanyana Suponok

	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			
Chaiwut Boonyasiriwat	6	7	8	7	7	7	6	5	7			
Myeung 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			
Garin 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. Artificial Muscle			7. Shaded Pole			1					
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 Freeman 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>	Opp.: <u>Switzerland</u>	Rev.: <u>Nigeria</u>
5	5	5
Physics ± 3	Physics ± 3	Physics ± 3
☒ Correct and relevant physics	☒ Correct and relevant physics	☐ Correct and relevant physics
☒ Scientific approach	☐ Scientific approach	☐ Scientific approach
☒ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 1
☒ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☒ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☒ Contribution to the discussion		
Final Grade: Reporter <u>5</u>	Final Grade: Opponent <u>6</u>	Final Grade: Reviewer <u>4</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.: 12
 Junor: Must Kalanur Signature: api malya

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 ☒ Correct and relevant physics ☒ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	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
Presentation ± 1 ☒ Clear and understandable ☐ Appropriate manner ☐ Overall impression	Presentation ± 1 ☒ Clear and understandable ☐ Appropriate manner ☐ Overall impression	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	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 <u>6</u>	Final Grade: Opponent <u>7</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: 1 Problem no.: 17
 Juror: QTAUN 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: JR

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

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

7

Opp.: SWITZ.

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

6

Rev.: 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

+0.5

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

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.: Taiwan
Chris Nany-Tai 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.: Switzerland
Phyllis Barth 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.: Nigeria
Rebecca Bayo 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

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: 8 Stage: 1 Problem no.: 17
 Juror: Zekker Waisel 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

-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

0,5

Final Grade: Reporter

4

Opp.: 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

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.: [Blank]

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

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: 2 Problem no.: 14
 Junor: 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.: <u>Switzerland</u>	Opp.: <u>Kenya</u>	Rev.: <u>Taiwan</u>
5	5	5
Physics ± 3 ☐ Correct and relevant physics ☒ Scientific approach ☐ Validity of conclusions ☒ Accurate answers +2,5	Physics ± 3 ☒ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers 0,5	Physics ± 3 ☒ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers +2
Presentation ± 1 ☒ Clear and understandable ☐ Appropriate manner ☒ Overall impression 0	Presentation ± 1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression 0	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	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	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: Reporter <u>7</u>	Final Grade: Opponent <u>6</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: 8 Stage: 2 Problem no.: 14
 Juror: Dr. Preet Kalasuri Signature: ops mly

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 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 6

Opp.: 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 4

Rev.: 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 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: 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>[Signature]</u>
5	5	5
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☐ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter <u>4</u>	Final Grade: Opponent <u>5</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: 8 Stage: 2 Problem no.: 14
 Juror: J. BARCOMBE Signature: JS Bar

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

Rep.: SWITZ 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

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.: NIGERIA 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

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.: TAIWAN 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

Final Grade: Reviewer

7.6

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: 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

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- 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
Loise 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 Ojo

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
Chang Yia-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 Muzel's 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

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- 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.: Tadwan

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

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: Kim Freeman 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 -2.8

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

Presentation ± 1 0

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

Reporter ± 1 +0.6

- ☒ 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 ± 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 +0.3

- ☒ 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 ± 3 4.5

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

Presentation ± 1 4.3

- ☒ 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

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: Pranav Kalasuri 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.
- 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
☐ Correct and relevant physics	☐ Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	☐ Accurate answers	☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1
☐ Quality of experimental technique(s)	☐ Response to the reporter's solution	☐ Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points of the report	☐ Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and symbols	☐ Finds shortcomings or errors in the report	☐ Relevance of questions to both the reporter and the opponent
☒ Appropriate models, conformity of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed by the reporter or the opponent
☒ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	
☐ References, proper citations of ideas and input of others		
☐ Novelty of the report		
☐ Contribution to the discussion		
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer
9	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: 8 Stage: 3 Problem no.: 16
 Juror: QZAN SUH 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)
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- 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.
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Rep.: Ng 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.: TW 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

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.: Su 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

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 7

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
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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.: NIGERIA

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

0

Final Grade: Reporter

3

Opp.: TAIWAN

5

Physics ± 3

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

✓

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.: SWITZ

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

+0.5

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: 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)
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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.: Nigeria
Abdullah 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.: Taiwan
Cheng Yun-ching 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.: Switzerland
Marc Bittner 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: 8 Stage: 3 Problem no.: B.11.16
 Juror: Zakhar Maitels 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.: Mysore

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

+0.5

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

- ☐ 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.: 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

- ☐ 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

Round: 3 Room: 8 Fight Assistants: Sanchai 8 Jadsada

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Taiwan	Switzerland	Nigeria	Switzerland	Nigeria	Taiwan	Nigeria	Taiwan	Switzerland	Rep	Opp	Rev
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 Kalasuwat	6	7	7	6	4	6	3	6	7			
Bian 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	Nang-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	(19)			(14)			(16)					

Signature Fight Assistant: Sanchai 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 ALLISON Signature: Alan 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.: <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 ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	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
Presentation ± 1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	Presentation ± 1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	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	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 <u>5</u>	Final Grade: Opponent <u>6</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

Luck of control.

Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 1 Problem no.: 17
 Juror: Wassan Kundhikanjana 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.: Belarus 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.: Macao 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.: Russia 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

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: 1 Problem no.: 17
 Junor: 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.:	Opp.:	Rev.:
5	5	5
Physics ± 3	Physics ± 3	Physics ± 3
☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☒ Accurate answers	☒ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	☒ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☒ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 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	☐ 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	☐ 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	Final Grade: Opponent	Final Grade: Reviewer
4	7	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: 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.:	Opp.:	Rev.:
5	5	5
Physics ± 3	Physics ± 3	Physics ± 3
☒ Correct and relevant physics ☒ Scientific approach ☒ Validity of conclusions ☐ Accurate answers	☐ Correct and relevant physics ☐ Scientific approach ☒ Validity of conclusions ☐ Accurate answers	☒ Correct and relevant physics ☐ Scientific approach ☒ Validity of conclusions ☐ Accurate answers
Presentation ± 1	Presentation ± 1	Presentation ± 1
☐ Clear and understandable ☐ Appropriate manner ☒ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression
Reporter ± 1	Opponent ± 1	Reviewer ± 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	☐ 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	☐ 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	Final Grade: Opponent	Final Grade: Reviewer
3	4	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: 1 Problem no.: 17
 Juror: Tan Jey 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

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

4

Final Grade: Reporter

Opp.: Louise Ong

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

5

Final Grade: Opponent

Rev.: Nikolay

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: 9 Stage: 1 Problem no.: 17
 Juror: MONSIEUR 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

-1

Presentation ± 1

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

-1

Reporter ± 1

- ☐ Quality of experimental technique(s) $\Rightarrow$ 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

-1

no units.

Final Grade: Reporter

2

Opp.: MACAU

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

5

Rev.: RUSSIA

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

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: 9 Stage: 2 Problem no: 7
 Juror: ALAN ALLWSON Signature: Al Allwson

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
Chon Han In 5

Physics ± 3 -1/2

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

Presentation ± 1 OK

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

Reporter ± 1 -

- ☐ Quality of experimental technique(s) *weak*
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions *not shown*
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report *4/2*
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: RUSSIA
Vitali M 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

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

Final Grade: Opponent

Rev.: BEARUS
ANTON R 5

Physics ± 3 +1/2

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

Presentation ± 1 ✓

- ☐ 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 *NOT CLEAR*
- ☐ 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: Hanssen Kindelkary 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.: McGo Rejoice #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.: Russ
 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: Chen 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

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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.: 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.: 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.: 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 +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: 9 Stage: 2 Problem no.: 7
 Juror: Goleen Nauder 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

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- 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 -1.5

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

Presentation ± 1 -

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

Reporter ± 1 -1.5

- ☒ 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 ± 3 -1.5

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

Presentation ± 1 -

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

Opponent ± 1 -1.5

- ☒ 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

Rev.: 5

Physics ± 3 -1.5

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

Presentation ± 1 -1.5

- ☐ 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

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: 9 Stage: 2 Problem no.: 7
 Juror: Tan Jy Signature: Tan

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)
- 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.: Chen Han Jun

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

0

Final Grade: Reporter

5

Opp.: Vitali

max tuning

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.: Antony

Rusman

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

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: 2 Problem no.: 7
 Juror: HONSIT. Signature: H-T-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

- ☐ 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

4

Opp.: RUSSIA

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.: BELARUS

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

0.5

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: 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 ± 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 +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.: BEARUS
Anastasiya 5

Physics ± 3 -1/2

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

Presentation ± 1 1

- ☐ 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

was clearer after Q&A discussion but focus on other diffusive systems.

Final Grade: Opponent 6

Rev.: MACAO
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

good summary but no real input

Final Grade: Reviewer 5

Final Grade: Reporter 8

*IS A LOW TIME SCALE PROBLEM
 viscosity, other subjects, other described particles...*

Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 3 Problem no.: 8
 Juror: Worrasom Kunthitayakorn 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

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- 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

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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)
- 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

+1.5

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

7

Opp.: Belarus

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

4

Rev.: Marco

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

Scoring Guidelines

Fight (Round no.): 3 Room: 9 Stage: 3 Problem no.: 8
 Juror: Shun Yang Li Signature: Cheng Li

A report should include:

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- an explanation of the observed phenomena
- an application of appropriate mathematics
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- linking of theoretical and experimental findings to draw suitable conclusions
- an attempt to communicate difficult or complex ideas in an effective and understandable manner

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- the opponent appreciated and highlighted the strengths and weaknesses of the report

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- 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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- 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

+0.5

Presentation ± 1

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

+0.2

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

+0.3

Final Grade: Reporter

6

Opp.: Belarus

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

+0.5

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: 9 Stage: 3 Problem no.: 8
 Juror: Golcia Vander 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 ☒ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers	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
Presentation ±1 ☒ Clear and understandable ☐ Appropriate manner ☐ Overall impression	Presentation ±1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	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	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 5	Final Grade: Opponent 4	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: Tan Jy Signature: TJ

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

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.: Augustus

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

4

Rev.: Philip

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.): 3 Room: 9 Stage: 3 Problem no.: 8
 Juror: MONSIEUR Signature: M. Tuff

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 Kundhikanjan	4	6	7	3	4	5	7	4	6			
Chuan Yong Li	4	7	7	4	6	7	6	5	7			
Sanda Mirel Galcea	3	4	5	4	5	6	5	4	6			
Joy Tan	4	5	5	5	6	7	6	4	5			
Monsit Tanasittikorn	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 Naderov Lagin			
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):