

Round: 1 Room: 1 Fight Assistants: Mr. Komsan Papaway

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Singapore Rep	Poland Opp	Romania Rev	Poland Rep	Romania Opp	Singapore Rev	Romania Rep	Singapore Opp	Poland Rev	Rep	Opp	Rev
Martin Plasc (Chair)	6	8	6	5	5	8	3	8	9			
Feng Song	6	7	7	6	5	8	4	7	8			
Volodymyr Kutinskyi	8	9	6	6	6	7	6	8	9			
Lars Gisten	7	8	6	6	5	7	4	6	7			
Kent Hogan	7	8	6	7	6	6	3	9	7			
Acting Team Member	Shen Yu Jun	Radoslaw Wasicki -WICZ	GOLBIS ANCA	Frederic Grabowski	Horia Măgureanu	KOH JIN MINCE	Alexandra Pădău	8 MI TIMARU AOL	Anna Wald			
Rejected Problems	15 Moving Grass			No			10 Singing Blades of Grass					
Accepted Problem	6 Magpies Glide			13 Magpie's Production			19 Thick Lines					

Signature Fight Assistant: Michael Brown Double-checked with Scoring Guidelines by second Fight Assistant (signature): 778495 20407

See up to

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: 1 Problem no.: 6
 Juror: Kent Hagar 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.: Shen Yu Jun
Singapore 5

Physics ± 3 +1

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

Presentation ± 1 +1/2

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

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.: Radosław
Poland 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 8

Rev.: Goldis Anca
Romania 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

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.): 1 Room: 1 Stage: 1 Problem no.: 6
 Juror: LAAS GISEL Signature: [Signature]

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- an explanation of the observed phenomena
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Rep.: SINGAPORE 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.: POLSKA 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 8

Rev.: 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

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

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Scoring Guidelines

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

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Rep.: Singapore
Shu Yi Jun

5

Physics ± 3

2.5

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

Presentation ± 1

0.5

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

Reporter ± 1

0.5

- ☒ 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.: Poland
Waskiewicz

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

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

9

Rev.: Romania

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

- ☒ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics 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.): 1 Room: 1 Stage: 1 Problem no.:
 Juror: Feng Song Signature: Feng Song

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- an explanation of the observed phenomena
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Rep.: 36 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.: PL 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.: RD 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

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Final Grade: Reviewer

7

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: 1 Problem no.: 1
 Juror: PL234 Signature: [Signature]

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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

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.: 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

Rev.: 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

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: 2 Problem no.: 13
 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)
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Rep.: Poland

5

Physics ± 3

+1

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

Presentation ± 1

+1/2

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

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.: Romania

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.: Singapore

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

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

6

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: 2 Problem no.: 13
 Juror: LARS GILSEN 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.: 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 0.5

- ☐ 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.: 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.: 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

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Final Grade: Reviewer

7

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: 11 Problem no.: 13
 Juror: Kulinskyi V. Signature: [Signature]

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- an explanation of the observed phenomena
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Rep.: Poland
Grabowski 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 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.: Romania
Magazeanu 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.: Singapore
Kan Jin Ming 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

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Final Grade: Reviewer 7

Scoring Guidelines

13
Fight (Round no.): 1 Room: 1 Stage: 2 Problem no.:

Juror: T. Song Signature: [Signature]

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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.: PL 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.: 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

5

Rev.: SG 5

Physics ± 3

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

Presentation ± 1

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

Reviewer ± 1

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

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

Final Grade: Reviewer

8

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: 2 Problem no.: 13
 Juror: PLA Sct 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 -0.5

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

Presentation ± 1 0

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

Reporter ± 1 0

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, 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 0.5

- ☐ 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 5

Rev.: 5

Physics ± 3 1.5

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

Presentation ± 1 0.25

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

Reviewer ± 1 0.75

- ☐ Provides a thorough review of report and discussion
- ☐ Expresses own opinion about topics 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.): 1 Room: 1 Stage: 3 Problem no.: 12
 Juror: Kent Hogen Signature: Kent Hogen

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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
Alexandra Badut

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.: Singapore
Wittmann Eich

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

9

Rev.: 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

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

7

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: 3 Problem no.: 12
 Juror: LARS GUSTAF 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.: 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

0

Final Grade: Reporter

4

Opp.: SINGAPORE

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.: 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

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

7

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: III Problem no.: 12
 Juror: Kyrlinskyi V. 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.: Romania
Alexander Babut

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

0,5

- ☒ 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.: Singapore
Witthan Goh

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

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

8

Rev.: Poland

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

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.): 1 Room: 1 Stage: 3 Problem no.: 12
 Juror: F. SONA 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.: PD 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.: SG 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.: PL 5

Physics ± 3

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

Presentation ± 1

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

Reviewer ± 1

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

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

Final Grade: Reviewer

8

Scoring Guidelines

Fight (Round no.): 1 Room: 1 Stage: 3 Problem no.: 12
 Juror: TEB 514 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	8	3

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

Scoring Guidelines

Fight (Round no.): 1 Room: 2 Stage: 1 Problem no.: 6
 Juror: OSTERLICH Signature: F. Osterl

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

-1.5

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

Presentation ± 1

0

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

Reporter ± 1

-0.25

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, 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.: UK

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

0.25

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

Final Grade: Opponent

7

Rev.: Brazil

5

Physics ± 3

2.5

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

Presentation ± 1

1.5

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

Reviewer ± 1

10.25

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

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

Final Grade: Reviewer

8

Scoring Guidelines

Fight (Round no.): 1 Room: 2 Stage: 1 Problem no.: 6
 Juror: KUNDRACK 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 -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

- ☒ Quality of experimental technique(s)
- ☒ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, 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.: UK 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 +0.5

- ☒ 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.: BRAZIL 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.): 1 Room: 2 Stage: 1 Problem no.: 6 (Magnus)
 Juror: Bunrat Wattanakasimach Signature: hs 25

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

-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

5

Final Grade: Reporter

Opp.: 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

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

6

Final Grade: Opponent

Rev.: Brazil

5

Physics ± 3

+0.5

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

Presentation ± 1

+1

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

Reviewer ± 1

+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

7

Final Grade: Reviewer

Scoring Guidelines

Fight (Round no.): 1 Room: 2 Stage: 1 Problem no.: 6
 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.: HS

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.: UK

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.: BR

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.): 1 Room: 2 Stage: 1 Problem no.: 6
 Junor: Zat Neng Chan Signature: Zat Neng Chan

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

5

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

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

Reviewer ± 1

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

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

Final Grade: Reviewer

6

Scoring Guidelines

Fight (Round no.): 2 Room: 2 Stage: 2 Problem no.: 17
 Juror: Ostermann Signature: F. Ostermann

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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>Brazil</u>	Rev.: <u>USA</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>6</u>	Final Grade: Reviewer <u>5</u>

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

Scoring Guidelines

Fight (Round no.): 1 Room: 2 Stage: 2 Problem no.: 17
 Juror: KUNDANEK 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 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.: BRAZIL 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

5

Rev.: USA 5

Physics ± 3

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

Presentation ± 1 +0.5

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

Reviewer ± 1 +0.5

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

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

Final Grade: Reviewer

7

Scoring Guidelines

Fight (Round no.): 1 Room: 2 Stage: 2 Problem no.: 17
 Juror: Pornrat Wattanakasimich Signature: h5 25

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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>Brazil</u>	Rev.: <u>USA</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>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.): 1 Room: 2 Stage: 2 Problem no.: 17

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.: UK 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

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, 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.: BR 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 +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.: US 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

6

Scoring Guidelines

Fight (Round no.): 1 Room: 2 Stage: 2 Problem no.: 17
 Juror: Iat Neng 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>BUK</u>	Opp.: <u>BR</u>	Rev.: <u>US</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>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.): 2 Room: 2 Stage: 3 Problem no.: 16
 Juror: Oscar Hernandez Signature: F. O. Hernandez

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: 5

Physics ± 3

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

Presentation ± 1

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

Reporter ± 1

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

Final Grade: Reporter

Opp.: 5

Physics ± 3

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

Presentation ± 1

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

Opponent ± 1

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

Final Grade: Opponent

Rev.: 5

Physics ± 3

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

Presentation ± 1

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

Reviewer ± 1

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

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

Final Grade: Reviewer

Scoring Guidelines

Fight (Round no.): 1 Room: 2 Stage: 3 Problem no.: 16
 Juror: Luana Dora Signature: Luana Dora

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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>	Opp.: <u>USA</u>	Rev.: <u>UK</u>
5	5	5
Physics ± 3 <u>+1</u>	Physics ± 3 <u>+1</u>	Physics ± 3 <u>+1</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>+1</u>	Presentation ± 1 <u>0</u>	Presentation ± 1 <u>0</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</u>	Opponent ± 1 <u>+1</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>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.): 1 Room: 2 Stage: 3 Problem no.: 16
 Juror: Bonrat Wattanakasimich Signature: hif 2r

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

+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.: US

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

5

Rev.: UK

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.): 1 Room: 2 Stage: 3 Problem no.: 16
 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.: BR 5

Physics ± 3 -1

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

Presentation ± 1 +1

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

Reporter ± 1 +1

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

Final Grade: Reporter 6

Opp.: US 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 6

Scoring Guidelines

Fight (Round no.): 1 Room: 2 Stage: 3 Problem no.: 16
 Juror: Iat Neng Chan Signature: Z. Lee

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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>BR</u>	Opp.: <u>US</u>	Rev.: <u>UK</u>
5	5	5
Physics ± 3 ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers <u>+0.5</u>	Physics ± 3 ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers <u>0</u>	Physics ± 3 ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers <u>0</u>
Presentation ± 1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression <u>+0.5</u>	Presentation ± 1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression <u>+0.5</u>	Presentation ± 1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression <u>+0.5</u>
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 <u>+1</u>	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 <u>-0.5</u>	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 <u>+0.5</u>
Final Grade: Reporter <u>7</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

Round: 1 Room: 2 Fight Assistants: Kumpakorn Palanong / Jiraporn Saenjae

	Stage 1			Stage 2			Stage 3			Stage 4		
Team	USA	UK	Brazil	UK	Brazil	USA	Brazil	USA	UK			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Florian Ostermaier	3	7	8	4	6	5	7	7	7			
František Kundracik	4	4	7	4	5	7	7	7	7			
Pornrat Nattarakasineh	5	6	7	5	7	6	6	5	6			
Knang Joo kim	4	6	7	6	6	6	6	5	6			
Iat Meng Chan	5	7	6	6	7	6	7	5	6			
Acting Team Member	Andrew Mangabat	Dominic Dootson	Thiago Bergamaschi	Yuying Xu	Mathew Camacho	John Lukowski	Thiago Bergamaschi	David Nascari	Dominic Dootson			
Rejected Problems	11			1			1					
Accepted Problem	6			17			16					

Signature Fight Assistant: Kumpakorn Palanong Double-checked with Scoring Guidelines by second Fight Assistant (signature): Jiraporn Saenjae

Round: 1 Room: 3 Fight Assistants: Jaru Jutimoosik ; Rojnopa Thararas

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	AUS Rep	NZ Opp	Bulg Rev	NZ Rep	Bulg Opp	AUS Rev	Bulg Rep	AUS Opp	NZ Rev	Rep	Opp	Rev
Ulrike Regner	5	8	8	4 ⁴	7	5	7	4	8			
Leszek Glabczuk	5	6	6	6	7	7	7	7	8			
Naxumign: Subwanjandee	5	7	5	6	7	4	6	6	7			
Bian Son	5	8	8	6	7	8	7	6	7			
Peter Jenei	5	8	7	4	5	5	5	6	7			
Acting Team Member	Isaac Edward	Jack Tiegida	Mitao Donkov	Catherine Pot	Dilyan Hristov	Grace Rehn	Dilyan Hristov	Kevin Zhang	Catherine Pot			
Rejected Problems	-			-			-					
Accepted Problem	9			4			13 Magnetic pendulum					

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

W. B.

Scoring Guidelines

Fight (Round no.): 1 Room: 3 Stage: 1 Problem no.: 9
 Juror: REQUER 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
Isaac Edwards

5

Physics ± 3

0

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

Presentation ± 1

0

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

Reporter ± 1

0

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

Final Grade: Reporter

5

Opp.: NZ
God Tregghe

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

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

8

Rev.: Bulgaria
Miro Benkov

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

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.): 1 Room: 3 Stage: 1 Problem no.: 9
 Juror: Grochleruk Signature: L. Cvetkovic

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 -1

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

Presentation ± 1 .25

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

Reporter ± 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 5

Opp.: New Zealand 5

Physics ± 3 0

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

Presentation ± 1 1.0

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

Opponent ± 1 0.25

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

Final Grade: Opponent 6

Rev.: Bulgary 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 .25

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

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

Final Grade: Reviewer 6

Scoring Guidelines

Fight (Round no.): 1 Room: 3 Stage: 1 Problem no.: 9
 Juror: Naruna Signature: N8.

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

5

Final Grade: Reporter

Opp.: New Zealand

5

Physics ± 3

0.5

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

Presentation ± 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

4

Final Grade: Opponent

Rev.: Bulgaria

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

5

Final Grade: Reviewer

Scoring Guidelines

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

Physics ± 3 0

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

Presentation ± 1 0

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

Reporter ± 1 0

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

Final Grade: Reporter 5

Opp.: 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

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 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

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.): 1 Room: 3 Stage: 1 Problem no.: 9

Juror: PETER ZELER 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.: AUS TRALIA 5

Physics ± 3 0

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

Presentation ± 1 0

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

Reporter ± 1 0

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

Final Grade: Reporter 5

Opp.: NEW ZEALAND 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 3

Rev.: BULGARIA 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

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.): 1 Room: 3 Stage: 2 Problem no.: 4
 Juror: RECNER Signature: Weg

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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
Colin Poth

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

4

Opp.: Bulgaria
Dilyan Hristov

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.: Australia
Grace Nelson

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.): 1 Room: 3 Stage: 2 Problem no.: 4
 Juror: L. Grodenik Signature: L. Grodenik

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

Final Grade: Reporter 6

Opp.: Bulgary 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.: Australia 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

#4 Ugnid Film Motor

Scoring Guidelines

Fight (Round no.): 1 Room: 3 Stage: 2 Problem no.: _____
 Juror: Nanna Signature: N8.

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

- ☐ 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.: Bulgaria

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.: Australia

5

Physics ± 3

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

Presentation ± 1

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

Reviewer ± 1

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

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

Final Grade: Reviewer

4

Scoring Guidelines

Fight (Round no.): 1 Room: 3 Stage: 2 Problem no.: 4
 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.: NZ 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.: Pog 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

7

Rev.: Ans 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.): 1 Room: 3 Stage: 2 Problem no.: 6
 Juror: PETER JENEI 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

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.: BULGARIA

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.: AUSTRALIA

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.): 1 Room: 3 Stage: 3 Problem no.: 13
 Juror: RECVER Signature: Heq

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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
Dizya Rishov

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

7

Opp.: Australia
Ravi Zhang

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

4

Rev.: NZ
Celine Pot

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.): 1 Room: 3 Stage: 3 Problem no.: 13
 Junor: Leszek Giedyk Signature: L. Giedyk

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Bulgary 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 7

Opp.: Australia 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.: New Zealand 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.): 1 Room: 3 Stage: 3 Problem no.: 13
 Juror: Nanna Signature: NS

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 +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.: Australia 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 +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.: New Zealand 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 +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.): 1 Room: 3 Stage: 3 Problem no.: 13
 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>PAT</u>	Opp.: <u>Aus</u>	Rev.: <u>NB</u>
5	5	5
Physics ± 3	Physics ± 3	Physics ± 3
1	1	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
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
1	0	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		
7	6	7
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

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

Scoring Guidelines

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

Juror: PETER ZENEI 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.: BULGARIA

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

5

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

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.: NEW ZEALAND

5

Physics ± 3

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

1

Presentation ± 1

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

1

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

4

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

Round: 1 Room: 4 Fight Assistants: Ramu Rhinjaranphom, Aditthep Butraburri

	Stage 1			Stage 2			Stage 3			Stage 4		
Team	12	CH	SW1	China	Sw.	row	Sw1	man	China			
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Asson Kyaldjiev	5	6	7	4	6	6	3	3	8			
Kathryn Zealand	7	6	7	6	6	4	4	6	7			
Myeung Hoi Uwan	5	6	6	5	6	7	6	6	8			
Rainer Reichle	5	7	6	4	5	6	4	5	7			
Andrey Shchetnikov	4	5	6	4	7	6	3	3	6			
Acting Team Member	Yasamin Masoumi	Guanghe Cong	Lioba Heimbock	Siahong Yi	Kathrin Laxhuber	Amirhossein Hadj	Phyllis Borda	Yasamin Masoumisolidkhani	Keham Lu.			
Rejected Problems							No. 11, No. 15.					
Accepted Problem	No. 13 Magnetic Pendulum			No. 10			No. 2					

Signature Fight Assistant: Double-checked with Scoring Guidelines by second Fight Assistant (signature): 

Scoring Guidelines

Fight (Round no.): 1 Room: 4 Stage: 1 Problem no.: B
 Juror: Myuldyev 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 +0.1

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

Reporter ± 1

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

Final Grade: Reporter

5

Opp.: 5

Physics ± 3

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

Presentation ± 1

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

Opponent ± 1

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

Final Grade: Opponent

6

Rev.: 5

Physics ± 3

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

Presentation ± 1 +0.5

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

Reviewer ± 1 +0.5

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

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

Final Grade: Reviewer

4

Scoring Guidelines

Fight (Round no.): 1 Room: 4 Stage: 1 Problem no.: 13
 Juror: Kathryn Zealant Signature: Kathryn Zealant

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

missed a clear physical explanation for jump
 Physics ± 3

$+1\frac{1}{2}$

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

Presentation ± 1

$-1\frac{1}{2}$

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

spoke very fast
 Reporter ± 1

$+1\frac{1}{2}$

- ☐ 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

6 $\uparrow$ 7

Opp.: CHINA

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.: SWEDEN

5

Physics ± 3

$+1\frac{1}{2}$

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

Presentation ± 1

0

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

Reviewer ± 1

$+1\frac{1}{2}$

- ☒ 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

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.): 1 Room: 4 Stage: 1 Problem no.: 13
 Juror: M.H. Kwon Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: 5

Physics ± 3

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

Presentation ± 1

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

Reporter ± 1

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

Final Grade: Reporter 5

Opp.: 5

Physics ± 3

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

Presentation ± 1

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

Opponent ± 1

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

Final Grade: Opponent 6

Rev.: 5

Physics ± 3

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

Presentation ± 1

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

Reviewer ± 1

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

Final Grade: Reviewer 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.): 1 Room: 4 Stage: 1 Problem no.: 13
 Juror: Rainer Reichle Signature: Rainer 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.
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Rep.: JR 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 5

Opp.: CN 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

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.: CH 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 6

Scoring Guidelines

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

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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.: Iran

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

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

0

Final Grade: Opponent

5

Rev.: Switzerland

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

+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

6

Scoring Guidelines

Fight (Round no.): 1 Room: 4 Stage: 2 Problem no.: 10

Juror: Akyudjiev 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 -0.7

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

Presentation ± 1 0

- ☐ 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

Opp.: 5

Physics ± 3 0.2

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

Presentation ± 1 0.5

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

Opponent ± 1 0.2

- ☐ 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.: 5

Physics ± 3 +0.5

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

Presentation ± 1 +0.3

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

Reviewer ± 1 +0.3

- ☐ 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

Scoring Guidelines

Fight (Round no.): 1 Room: 11 Stage: 2 Problem no.: 10
 Juror: Karlheinz Zeidler Signature: K. Zeidler

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

well explained but basic
 Physics ± 3

0

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

Presentation ± 1

+1

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

Reporter ± 1

0

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

Final Grade: Reporter

6

Opp.: SWEDEN

5

Physics ± 3

+1/2

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

Presentation ± 1

0

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

Opponent ± 1

+1/2

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

Final Grade: Opponent

6

Rev.: IRAN

5

Physics ± 3

-1

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

Presentation ± 1

+1/2

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

Reviewer ± 1

-1/2

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

Final Grade: Reviewer

4

Scoring Guidelines

Fight (Round no.): 1 Room: 4 Stage: 2 Problem no.: 10
 Juror: M. H. Kuen 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 +1

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

Presentation ± 1 -1

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

Reporter ± 1 0

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

Final Grade: Reporter 5

Opp.: 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 0

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

Final Grade: Opponent 6

Rev.: 5

Physics ± 3 2

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

Presentation ± 1 0

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

Reviewer ± 1 0

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

Final Grade: Reviewer 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.): #1 Room: 4 Stage: 2 Problem no.: 10
 Juror: Pamela Reichelt Signature: Pamela Reichelt

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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>CN</u>	Opp.: <u>CH</u>	Rev.: <u>JR</u>
5	5	5
Physics ±3 -1	Physics ±3 -1	Physics ±3 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 1	Presentation ±1 0	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 +0.5	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 4	Final Grade: Opponent 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.): 2 Room: 4 Stage: 2 Problem no.: 10
 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.: China 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** 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.: Switzerland 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

- 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.: 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

- 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

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

rejected 11.15

Scoring Guidelines

Fight (Round no.): 1 Room: 4 Stage: 3 Problem no.: 2
 Junor: AKyulajiev Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: 5

Physics ± 3

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

Presentation ± 1

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

Reporter ± 1

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

Final Grade: Reporter

3

Opp.: 5

Physics ± 3

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

Presentation ± 1

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

Opponent ± 1

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

Final Grade: Opponent

3

Rev.: 5

Physics ± 3

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

Presentation ± 1

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

Reviewer ± 1

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

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.): 1 Room: 4 Stage: 3 Problem no.: 2
 Juror: Karl Teabrold Signature: KLM

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

-1 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

4

Opp.: IRAN

5

Need to engage w/ her theory
 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

if the lack of "physics system" was most important, why not start discussion with that?

Final Grade: Opponent

6

Rev.: CHINA

5

good physics
 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.): 1 Room: 4 Stage: 3 Problem no.: _____
 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.: Phyllis Barth 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.: Yasaman 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 6

Rev.: Kahm Lu 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

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 8

Scoring Guidelines

Fight (Round no.): #1 Room: 4 Stage: 3 Problem no.: 2
 Juror: Pamela Perich Signature: Pamela Perich

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: CH 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

☐ Quality of experimental technique(s)

☐ Structure

☐ Explanation of formulae and symbols

☐ Appropriate models, conformity of dimensions

☐ Slides, 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.: JR 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 5

Rev.: CN 5

Physics ± 3 0

☐ Correct and relevant physics

☐ Scientific approach

☐ Validity of conclusions

☐ Accurate answers

Presentation ± 1 1

☐ Clear and understandable

☐ Appropriate manner

☐ Overall impression

Reviewer ± 1 1

☐ Provides a thorough review of report and discussion

☐ Expresses own opinion about topics presented or discussed

☐ Relevance of questions to both the reporter and the opponent

☐ Draws attention to points missed by the reporter or the opponent

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.): 1 Room: 4 Stage: 3 Problem no.: 2
 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

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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)
- such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

- ☒ 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

3

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

3

Final Grade: Opponent

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

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

2

Round: 1 Room: 5 Fight Assistants: Taweesak Chaiyakhun, Wanchaloem Pongpant

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Kenga Rep	Ukraine Opp	Macao Rev	Ukraine Rep	Macao Opp	Kenga Rev	Macao Rep	Kenga Opp	Ukraine Rev	Rep	Opp	Rev
Juror												
Philip O'Neill	3	6	5	6	7	3	4	5	6			
John Balcombe	3	6	5	6	6	3	3	2	3			
Mihály Homösfrei	3	8	6	5	4	3	4	4	5			
Uno Uno	3	5	5	5	6	3	4	4	4			
Valiantin Astashevski	3	4	5	7	7	3	4	4	5			
Acting Team Member	Nathan S Antrobus	Melnyk Eugene	Philip Naderex P. Lagniton	Rogovoy Nikita	Jingyi Xie	Sousuke Norabin	Chin Hok Leang	Ituga Wanjan	Rogovoy Nikita			
Rejected Problems	1			1			1					
Accepted Problem	6. Magnus glider			A. Liquid Film Motor			15. Moving brush					

Signature Fight Assistant: Wanchaloem Double-checked with Scoring Guidelines by second Fight Assistant (signature): Taweesak

Ben W. Pongpant

Scoring Guidelines

Fight (Round no.): 1 Room: 5 Stage: 1 Problem no.: 6
 Juror: O'NEILL Signature: AGO: Mill

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

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- the opponent challenged the reporter's understanding of the presented concepts, theories and principles
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- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent
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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.: KENYA 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 3

Opp.: UKRAINE 5

Physics ± 3 0

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

Presentation ± 1 .5

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

Opponent ± 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 6

Rev.: MACAO 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.): 1 Room: 5 Stage: 1 Problem no.: 6
 Juror: J. BALCOMBE Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: KENYA 5

Physics ± 3 -2.5

- ☒ 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 3

Opp.: UKRAINE 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.: MACAO 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.): 1 Room: 5 Stage: 1 Problem no.: 6
 Juror: HOMOSTREI / MIHAY 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

-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

3

Opp.: Ukraine

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

8

Rev.: Macao

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

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.): 1 Room: 5 Stage: 1 Problem no.: 1
 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.: Kenya 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.: Ukraine 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.: Macao 5

- Physics ± 3
- ☐ Correct and relevant physics
 - ☐ Scientific approach
 - ☐ Validity of conclusions
 - ☐ Accurate answers

- Presentation ± 1
- ☐ Clear and understandable
 - ☐ Appropriate manner
 - ☐ Overall impression

- Reviewer ± 1
- ☐ Provides a thorough review of report and discussion
 - ☐ Expresses own opinion about topics presented or discussed
 - ☐ Relevance of questions to both the reporter and the opponent
 - ☐ Draws attention to points missed by the reporter or the opponent

Final Grade: Reviewer

5

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

Scoring Guidelines

Fight (Round no.): 1 Room: 5 Stage: 1 Problem no.: 6
 Juror: Astasky nski Signature: B. P.

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
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- Consider the following suggestions to add to or deduct from the initial 5 points.
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Rep.: Kenya 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 3

Opp.: Ukraine 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 4

Rev.: Macao 5

Physics ± 3 0.2

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

Presentation ± 1 0

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

Reviewer ± 1 0

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

Final Grade: Reviewer 5

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

Scoring Guidelines

Fight (Round no.): 1 Room: 5 Stage: 2 Problem no.: 4
 Juror: O'NEILL Signature: M. O'Neill

A report should include:

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

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

Rep.: UKRAINE

5

Physics ± 3

1

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

Presentation ± 1

-1/2

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

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

6

Opp.: MALAO

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

7

Rev.: KENYA

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

3

Scoring Guidelines

Fight (Round no.): 1 Room: 5 Stage: 2 Problem no.: 4
 Juror: J. BALCOMBE Signature: JB

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: UKRAINE

5

Physics ±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.: MACAO

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.: KENYA

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

3

LACK OF QUANTITATIVE DATA!

Scoring Guidelines

Fight (Round no.): 1 Room: 5 Stage: 2 Problem no.: 4
 Juror: Hökösre, R. H. H. 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.: 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

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.: Macao

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

7

Rev.: Kenya

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

3

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.): _____ Room: 5 Stage: 2 Problem no.: 4
 Junor: Ukraine 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

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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

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- The reporter, opponent and reviewer each start with 5 points.
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- Select each partial grade from each section and write it in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Ukraine 5

Physics ± 3
☐ Correct and relevant physics
☐ Scientific approach
☐ Validity of conclusions
☐ Accurate answers +1

Presentation ± 1
☐ Clear and understandable
☐ Appropriate manner -1
☐ Overall impression

Reporter ± 1
☐ Quality of experimental technique(s)
☒ Structure +1
☐ Explanation of formulae and symbols X
☐ Appropriate models, conformity of dimensions X
☒ Slides, on-site experiments, audio, video, as appropriate
☐ References, proper citations of ideas and input of others X
☐ Novelty of the report X
☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Macao 5

Physics ± 3
☐ Correct and relevant physics
☐ Scientific approach
☐ Validity of conclusions
☐ Accurate answers +1

Presentation ± 1
☐ Clear and understandable
☐ Appropriate manner -1
☐ Overall impression

Opponent ± 1
☐ Response to the reporter's solution +1
☐ 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.: Kenya 5

Physics ± 3
☐ Correct and relevant physics
☐ Scientific approach
☐ Validity of conclusions
☐ Accurate answers

Presentation ± 1
☐ Clear and understandable
☐ Appropriate manner -1
☐ Overall impression

Reviewer ± 1
☐ Provides a thorough review of report and discussion X
☐ Expresses own opinion about topics 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.): 1 Room: 5 Stage: 2 Problem no.: 4
 Juror: Ashtashynski Signature: B. An

A report should include:

- a presentation of the appropriate concepts, theories and principles of the problem
- an explanation of the observed phenomena
- an application of appropriate mathematics
- reasonable experimental technique to gather and record data (or demonstrate the phenomena if appropriate)
- 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

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

Rep.: Ukraine

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

+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.: Macar

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.: kenya

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

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

3

Scoring Guidelines

Fight (Round no.): 1 Room: 5 Stage: 3 Problem no.: 15
 Juror: O'NEILL Signature: 190A

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
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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
- the reviewer appreciated the important aspects (especially the controversial ones)
- the reviewer's personal opinion was in evidence (not just superficial observations)
- such personal opinions were informative, 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.: MA CAO 5

Physics ± 3

- ☒ 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 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.: KENYA 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 $\frac{1}{2}$

- ☒ 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 5

Rev.: 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

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 6

Scoring Guidelines

Fight (Round no.): 1 Room: 5 Stage: 3 Problem no.: 15
 Juror: J. BALCOMBE Signature: HL Ben

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: NACAO 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 3

Opp.: KENYA 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

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 2

Rev.: UKRAINE 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 3

Scoring Guidelines

Fight (Round no.): 1 Room: 5 Stage: 3 Problem no.: 15

Juror: HOMISTREI, MINDEL 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
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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.: Kazan

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

Final Grade: Reporter

4

Opp.: Kenya

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

4

Rev.: 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

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.): 1 Room: 5 Stage: 3 Problem no.: 15
 Juror: Umo 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 understood the appropriate mathematics presented
- the opponent 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)
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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.: <u>Macao</u>	Opp.: <u>Kenya</u>	Rev.: <u>Ukraine</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>4</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.): 1 Room: 5 Stage: 3 Problem no.: 15
 Junor: Polishynski 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

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- The reporter, opponent and reviewer each start with 5 points.
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- Select each partial grade from each section and write it in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: Nacao

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.: Kenya

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.: Ukraine

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

8

Round: 1 Room: 6 Fight Assistants:

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Sweden Rep	Taiwan Opp	Czech-Rep Rev	Taiwan Rep	Czech-Rep Opp	Sweden Rev	Czech Rep	Sweden Opp	Taiwan Rev	Rep	Opp	Rev
Ginka Exner	5	7	6	6	6	7	6	4	7			
Nirut Pussadee	5	5	6	5	7	5	5	6	7			
Olga Inisheva	5	5	5	6	7	8	5	6	7			
Susan Napier	5	5	4	5	7	8	6	6	7			
Ilya Markchenko	7	8	6	5	5	7	5	4	9			
Julian												
Apichat. Acting Team Member	Fransiska	Hao Yu Ku	Daniel	Samuel Kon	Pavea Ber	Alexander AKK	Petr Sosna	Toomas Liiv	Yin-chieh-cheng			
Rejected Problems												
Accepted Problem	3			5			9					

Signature Fight Assistant: Sumbree Double-checked with Scoring Guidelines by second Fight Assistant (signature): J. Indera

Scoring Guidelines

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

Juror: Ginca Emar 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.: SE

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.: TW

5

Physics ± 3

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

Presentation ± 1

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

Opponent ± 1

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

7

Final Grade: Opponent

Rev.: CR

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.): 1 Room: 6 Stage: 1 Problem no.: 3
 Juror: Nirut Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: SE

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.: Th

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.: CZ

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.): 1 Room: 6 Stage: 1 Problem no.: 3
 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.: Sweden

5

Physics ± 3

- ☐ Correct and relevant physics experiment
- ☒ Scientific approach -0.5
- ☒ Validity of conclusions -0.5
- ☒ Accurate answers

Presentation ± 1

- ☒ Clear and understandable +0.25
- ☐ Appropriate manner
- ☒ Overall impression

Reporter ± 1

- ☒ Quality of experimental technique(s) +0.25
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☒ Appropriate models, conformity of dimensions
- ☒ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☒ Contribution to the discussion +0.25

5

Final Grade: Reporter

Opp.: Thailand
Taiwan

5

Physics ± 3

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

Presentation ± 1

- ☒ Clear and understandable -0.25
- ☒ Appropriate manner
- ☐ Overall impression

Opponent ± 1

- ☒ Response to the reporter's solution -0.25
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report +0.5
- ☐ Relevance of the questions
- ☒ Contribution to the discussion +0.25

5

Final Grade: Opponent

Rev.: Greek Rep

5

Physics ± 3

- ☒ Correct and relevant physics +0.25
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ± 1

- ☒ Clear and understandable +0.25
- ☐ Appropriate manner
- ☐ Overall impression

Reviewer ± 1

- ☐ Provides a thorough review of report and discussion 0
- ☒ Expresses own opinion about topics presented or discussed -0.25
- ☒ Relevance of questions to both the reporter and the opponent 0
- ☐ 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.): 1 Room: 6 Stage: 1 Problem no.: 3
 Juror: SUE NAPIER 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
Franska
Aspögen 5

Physics ± 3 0

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

Presentation ± 1 0

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

Reporter ± 1 0

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

Final Grade: Reporter 5

Opp.: Taiwan
Hao Yu Ku 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 Not really clear

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.: Czech
Daniel Rychly 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 Not really clear

Reviewer ± 1 -1

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

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

Final Grade: Reviewer 4

Scoring Guidelines

Fight (Round no.): 1 Room: 6 Stage: 1 Problem no.: 3
 Juror: Rya Martchenko 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.: Francis
Aspen
Sweden 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 7

Opp.: Hao Yuku
Taiwan 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 8

Rev.: Daniel Rychly
Czech 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

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.): 1 Room: 6 Stage: 2 Problem no.: 5

Juror: Gina Exner Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: TW

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.: CE

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.: SE

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.): 1 Room: 6 Stage: 2 Problem no.: 5
 Juror: Niraj Signature: Niraj

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

- ☐ 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.: CZ

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

2

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

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.): 1 Room: 6 Stage: 2 Problem no.: 5
 Juror: Olga Inisheva Signature: Olga

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 +0.5

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

Presentation ± 1 +0.25

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

Reporter ± 1 +0.25

- ☒ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, 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.: Gz Rep 5

Physics ± 3 +0.5

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

Presentation ± 1 +1

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

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.: Sweden 5

Physics ± 3 +1

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

Presentation ± 1 +1

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

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.): 1 Room: 6 Stage: 2 Problem no.: 5
 Juror: SUE NAPIER Signature: S Napier

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: TAIWAN
SAMUEL
ICAN

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.: CZECH
PAULA
BERESOVA

5

Physics ±3

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

+1/2

Presentation ±1

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

+1/2

Opponent ±1

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

+1

Final Grade: Opponent

7

Rev.: Sweden
ALEXANDER
AKERSSON

5

Physics ±3

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

+1/2

Presentation ±1

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

+1/2

Reviewer ±1

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

+1

Final Grade: Reviewer

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.): 1 Room: 6 Stage: 2 Problem no.: 5
 Juror: Vytautas KAPČIUS Signature: _____

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: <u>Taiwan</u> <u>Semuel Kan</u>	Opp.: <u>Greek Rep</u> <u>Pavlos Bektas</u>	Rev.: <u>Sweden</u> <u>Alexander Ahlsson</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	Final Grade: Opponent	Final Grade: Reviewer
5	5	7

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

Scoring Guidelines

Fight (Round no.): 1 Room: 6 Stage: 3 Problem no.: 9

Juror: Gina E. Kner 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.: GZ

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.: SE

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.: TW

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.): 1 Room: 6 Stage: 3 Problem no.: 9
 Juror: Ninrt Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: CZ 5

Physics ± 3

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

Presentation ± 1

- ☐ 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.: SE 5

Physics ± 3 1

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

Presentation ± 1

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

Opponent ± 1

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

Final Grade: Opponent

6

Rev.: TW 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.): 1 Room: 6 Stage: 3 Problem no.: 9
 Juror: Olga Inshava 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.: CzRep 5

Physics ± 3 0

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

Presentation ± 1 0

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

Reporter ± 1 0

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

Final Grade: Reporter 5

Opp.: Sweden 5

Physics ± 3 +0.25

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

Presentation ± 1

- ☒ 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.: Taiwan 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 +0.25

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

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.): 1 Room: 6 Stage: 3 Problem no.: 9
 Juror: SUE NAPIER Signature: S. Napier

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Petr 5
Sasha

Physics ± 3 $\frac{3}{2}$
☐ Correct and relevant physics
☐ Scientific approach
☐ Validity of conclusions
☐ Accurate answers

Presentation ± 1 $\frac{3}{2}$
☐ Clear and understandable
☐ Appropriate manner
☐ Overall impression

Reporter ± 1 0
☐ Quality of experimental technique(s)
☐ Structure good
☐ Explanation of formulae and symbols very good
☐ Appropriate models, conformity of dimensions
☐ Slides, on-site experiments, audio, video, as appropriate
☐ References, proper citations of ideas, and input of others
☐ Novelty of the report
☐ Contribution to the discussion

Final Grade: Reporter

6

Opp.: Sweden 5
Thomas
Liv

Physics ± 3 0
☐ Correct and relevant physics
☐ Scientific approach
☐ Validity of conclusions
☐ Accurate answers

Presentation ± 1 $\frac{3}{2}$
☐ Clear and understandable
☐ Appropriate manner
☐ Overall impression

Opponent ± 1 $\frac{3}{2}$
☐ 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.: Taiwan 5
Yin-chieh
cheng

Physics ± 3 +1
☐ Correct and relevant physics
☐ Scientific approach
☐ Validity of conclusions
☐ Accurate answers

Presentation ± 1 $-\frac{1}{2}$
☐ Clear and understandable
☐ Appropriate manner
☐ Overall impression too fast

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.): 1 Room: 6 Stage: 3 Problem no.: 9
 Juror: Ryan NORTCHENKO 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.: Ezech Ref
Raf Sosna 5

Physics ± 3 0

- ☐ 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

Opp.: Suzanne
Thomas Lin 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

Rev.: Taiwan
Yin-Chieh Chang 5

Physics ± 3 +3

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

Presentation ± 1 +1

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

Reviewer ± 1 0

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

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.): 1 Room: 7 Stage: 1 Problem no.: 3
 Juror: Felicia Ullstad Signature: Felicia Ullstad

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Slovakia
Edward Grankin

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

47

Opp.: Belarus
Anton Ruschov

5

Physics ± 3

+1

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

Presentation ± 1

0

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

Opponent ± 1

0

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

Final Grade: Opponent

6

Rev.: Korea
Jiwoo Kim

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

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.): 1 Room: 7 Stage: 1 Problem no.: 3
 Juror: Lobyshev Signature: Lobyshev

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Slovak 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.: Belarus 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.: Korea 5

Physics ± 3

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

Presentation ± 1

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

Reviewer ± 1

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

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

Final Grade: Reviewer

6

Scoring Guidelines

Fight (Round no.): 1 Room: 7 Stage: 1 Problem no.: 3
 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.: Slovakia
Edward

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

Final Grade: Reporter

4

Opp.: Belarus
Anton

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.: Korea
Jiwoo

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.): 1 Room: 7 Stage: 1 Problem no.: 3
 Juror: STANISLAV PAVLOV 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

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, photos
- ☐ References, proper citations of ideas and input of others
- ☐ Novelty of the report
- ☐ Contribution to the discussion

-1

Final Grade: Reporter

5

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

+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.: KOREA

5

Physics ± 3

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

+2

Presentation ± 1

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

+1

Reviewer ± 1

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

+1

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.): 1 Room: 7 Stage: 1 Problem no.: 3

Juror: Dina Ikadi 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.: Edward Aravin 5
Slovakia

Physics ± 3 +1.0

- ☐ 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.: Anton Ruzh 5
Belarus

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 8

Rev.: Korea 5
Jiwoo Kim

Physics ± 3 2.5

- ☐ 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

Final Grade: Reviewer 9

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

Scoring Guidelines

Fight (Round no.): 1 Room: 7 Stage: 2 Problem no.: 6
 Juror: Felicie Ullsted Signature: Felicie Ullsted

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

+1

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

Presentation ± 1

0

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

Reporter ± 1

+0.5

- ☐ 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.: 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.: Slovakia

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.): 1 Room: 7 Stage: 2 Problem no.: 6
 Juror: Lobyshev Signature: Vheky

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: <u>Belarus</u>	Opp.: <u>Korea</u>	Rev.: <u>Slovakia</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.): 1 Room: 7 Stage: 2 Problem no.: 6
 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

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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.: <u>Belarus</u> <u>Dmitri</u>	Opp.: <u>Korea</u> <u>Ahn Cheong Eung</u>	Rev.: <u>Slovakia</u> <u>Miroslav</u>
5	5	5
Physics ± 3 0	Physics ± 3 +1	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	Presentation ± 1 +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 0	Opponent ± 1 +1	Reviewer ± 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		
Final Grade: Reporter <u>5</u>	Final Grade: Opponent <u>8</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.): 1 Room: 7 Stage: 2 Problem no.: 6
 Juror: STANISLAV PAVOŠ Signature: Pavoš

A report should include:

- a presentation of the appropriate concepts, theories and principles of the problem
- an explanation of the observed phenomena
- an application of appropriate mathematics
- reasonable experimental technique to gather and record data (or demonstrate the phenomena if appropriate)
- 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.: 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

+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 graphs
- ☐ References, proper citations of ideas and input of others
- ☒ Novelty of the report
- ☐ Contribution to the discussion

0

Final Grade: Reporter

6

Opp.: 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

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.: 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

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.): 1 Room: 7 Stage: 2 Problem no.: 6

Juror: Dina Iskadi Signature: L. Fadiq

A report should include:

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

An opposition should show that:

- the opponent challenged the reporter's understanding of the presented concepts, theories and principles
- the opponent understood the appropriate mathematics presented
- the opponent 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.: Daniel Yarnofsky
Belarus

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.: Chang Gung
Korea

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.: Miroslav Gasparik
Slovakia

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.): 1 Room: 7 Stage: 3 Problem no.: 11
 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.: Korea

Jimmo Kim

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

2

Opp.: Slovakia

Adam Orban

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 -

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.: Bekrus

Smirny Bekrus

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

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.): 1 Room: 7 Stage: 3 Problem no.: 11
 Juror: Lobyshev Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: 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

- ☐ Quality of experimental technique(s)
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, 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.: Slovakia 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.: Belarus 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.): 1 Room: 7 Stage: 3 Problem no.: 11
 Juror: YE YEO Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: <u>Korea</u> <u>Juho Kim</u>	Opp.: <u>Slovakia</u> <u>Adam</u>	Rev.: <u>Belarus</u> <u>Dmitry</u>
5	5	5
Physics ± 3 0	Physics ± 3 0	Physics ± 3 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 0	Presentation ± 1 0	Presentation ± 1 0
☐ Clear and understandable	☐ Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
☐ Overall impression	☐ Overall impression	☐ Overall impression
Reporter ± 1 -1	Opponent ± 1 -1	Reviewer ± 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		
Final Grade: Reporter 4	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.): 1 Room: 7 Stage: 3 Problem no.: 14
 Juror: STANISLAV PALOS Signature: Palos

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: 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

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.: SLOVAKIA 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.: BELARUS 5

Physics ± 3 0

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

Presentation ± 1 0

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

Reviewer ± 1 +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.): 1 Room: 7 Stage: 3 Problem no.: 11

Juror: Dina Eladi 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>Jinsook Korea</u>	Opp.: <u>Adam Otlor Slovackia</u>	Rev.: <u>Dmitry Baranov Belarus</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

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

Final Grade: Reporter

6

Final Grade: Opponent

7

Final Grade: Reviewer

6

Revised after IOC feedback and approved by EC on 2012-11-03

Q

Round: 7 Room: 7 Fight Assistants:

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Slovakia	Belarus	Korea	Belarus	Korea	Slovakia	Korea	Slovakia	Belarus	Rep	Opp	Rev
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Felicia Ulsted (Chair)	7	6	8	6	6	5	2	7	6			
Valentin Lebyshch	4	7	6	7	7	7	3	7	7			
Ye-Yeo	4	6	5	5	8	8	4	4	6			
Stanislav Panas	5	7	9	6	8	8	3	7	6			
Dina Izadi	6	8	9	5	8	7	6	7	6			
Acting Team Member	EDUARD OROVKIN	Anton Rusanov	Jiwoo Kim	Daniil Yarmolkevich	Ahn Cheong Eung	Miroslav Gasperek	Jiwoo Kim	Adam Urban	Dmitriy Baranov			
Rejected Problems	-			-								
Accepted Problem	g. Artificial Muscle			b. Magnus Glider			n. Cat's Whisker					

Signature Fight Assistant: Double-checked with Scoring Guidelines by second Fight Assistant (signature):

8

Round: 1 Room: 8 Fight Assistants:

Team	Stage 1			Stage 3			Stage 4			Stage 4		
	Nigeria Rep	Hungary Opp	Austria Rev	Austria Rep	Nigeria Opp	Hungary Rev	Hungary Rep	Austria Opp	Nigeria Rev	Rep	Opp	Rev
Chuan Yong Li	5	6	8	6	5	7	6	7	6			
Mattias Anderson	3	7	7	7	3	5	6	7	4			
Tatyana Gerasimova	5	6	6	7	5	6	5	6	5			
Kenny Parker	3	4	5	7	4	8	7	5	4			
Sandu Mirel Golea	5	6	5	5	5	6	6	7	6			
Acting Team Member	Yusuf Shittu.	AKOS BIKO	NISE MARKUS	Amir Dellali	Philip Elushade.	Andras Louko	Tina Bonaczei	FRANK R.	Rebecca Banjo			
Rejected Problems	(10)			(17)								
Accepted Problem	(7)			(13)			(3)					

Signature Fight Assistant: Double-checked with Scoring Guidelines by second Fight Assistant (signature):

Bu [Signature]

Scoring Guidelines

Fight (Round no.): 1 Room: 8 Stage: 1 Problem no.: 7
 Juror: Chuan Yang Li Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: 5

Physics ± 3 0

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

Presentation ± 1 0

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

Reporter ± 1 0

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

Final Grade: Reporter

5

Opp.: 5

Physics ± 3 +0.5

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

Presentation ± 1

- ☐ 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.: 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 +0.5

- ☒ 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.): 1 Room: 8 Stage: 1 Problem no.: 7
 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.: Nigeria 5

Physics ± 3

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

Presentation ± 1 0

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

Reporter ± 1 0

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

Final Grade: Reporter 3

Opp.: Hungary 5

Physics ± 3

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

Presentation ± 1 0

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

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.: Austria 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.): 1 Room: 8 Stage: 1 Problem no.: 7

Juror: TATYANA G.S. Signature: TGS

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

+0.5

- +0.5 ☒ Correct and relevant physics
- +0.5 ☒ Scientific approach
- 0.5 ☒ Validity of conclusions
- ☐ Accurate answers

Presentation ± 1

0

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

Reporter ± 1

-0.5

- 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.: HUNGARY

5

Physics ± 3

+0.5

- ☒ Correct and relevant physics +0.25
- ☒ Scientific approach +0.25
- ☐ 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 +0.25
- ☐ Shows the strong and weak points of the report
- ☒ Finds shortcomings or errors in the report +0.25
- ☐ Relevance of the questions
- ☐ Contribution to the discussion

Final Grade: Opponent

6

Rev.: AUSTRIA

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 +0.3
- ☒ Expresses own opinion about topics presented or discussed +0.3
- ☒ Relevance of questions to both the reporter and the opponent +0.3
- ☒ Draws attention to points missed by the reporter or the opponent +0.1

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.): 1 Room: 8 Stage: 1 Problem no.: 7
 Juror: Kerry Parker Signature: Ken

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Yusuf Shittu
Nigeria

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.: Akos Biko
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

Final Grade: Opponent

4

Rev.: Niese Markus
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

5

Scoring Guidelines

Fight (Round no.): 1 Room: 8 Stage: 1 Problem no.: 7
 Juror: GOLCEA ANDU 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 -2

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

Presentation ± 1 0

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

Reporter ± 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 5

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 6

Rev.: 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.): 1 Room: 8 Stage: 2 Problem no.: _____
 Juror: Chuan-Yang Li Signature: Chuan-Yang 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.: 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

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

7

Rev.: Nigeria 5

Physics ± 3

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

Presentation ± 1

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

Reviewer ± 1

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

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.): 1 Room: 8 Stage: 2 Problem no.: 3
 Juror: Mathias Andersen 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.: Hungary 5

Physics ± 3 +1.5

- ☐ Correct and relevant physics
- ☐ Scientific approach *lots of experiments*
- ☐ Validity of conclusions *little bit of theory*
- ☐ Accurate answers

Presentation ± 1 -0.5

- ☐ Clear and understandable
- ☐ Appropriate manner *too fast*
- ☐ 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 +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.: Nigeria 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 *Ad*
- ☐ Expresses own opinion about topics presented or discussed
- ☐ Relevance of questions to both the reporter and the opponent
- ☐ Draws attention to points missed by the reporter or the opponent

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

Final Grade: Reviewer 4

Scoring Guidelines

Fight (Round no.): 1 Room: 8 Stage: 2 Problem no.: 3

Juror: TATYANA G.S. Signature: TGS

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: HUNGARY
TINA

5

Physics ± 3

-0.25

- ☒ 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

5.0

Opp.: AUSTRIA
FRANK, REBECCA

5

Physics ± 3

10.5

- ☒ 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

6.0

Rev.: NIGERIA
REBECCA

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

+0.25

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

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

Final Grade: Reviewer

5.0

Scoring Guidelines

Fight (Round no.): 1 Room: 8 Stage: 2 Problem no.: _____
 Juror: Kerry Parker Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Tímea Bánóczy 5
Hungary

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 +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.: Rebecca Frank 5
Austria

Physics ± 3 +0.5

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

Presentation ± 1 -

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

Opponent ± 1 +0.5

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

Final Grade: Opponent 5

Rev.: Rebecca Banjo 5
Nigeria

Physics ± 3 +0.5

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

Presentation ± 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 4

Scoring Guidelines

Fight (Round no.): 1 Room: 8 Stage: 2 Problem no.: _____
 Juror: GOLCHA JAVAN 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		
6	7	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.): 1 Room: 8 Stage: 3 Problem no.: 13
 Juror: Chuan-Yong Li Signature: [Signature]

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: 5

Physics ± 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.: 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.: 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 +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.): 1 Room: 8 Stage: 3 Problem no.: 13
 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.: Austria 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

7

Opp.: Nigeria 5

Physics ± 3 -1

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

Presentation ± 1 0

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

Opponent ± 1 -1

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

Final Grade: Opponent

3

Rev.: Hungary 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.): #1 Room: 8 Stage: 3 Problem no.: 13

Juror: TATIANA G. S. Signature: TGS

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

AMIR DELALI

5

Physics ±3

+0.5

- ☒ Correct and relevant physics +0.15
- ☒ Scientific approach +0.15
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1

+0.5

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

Reporter ±1

+0.75

- ☒ Quality of experimental technique(s) +0.15
- ☐ Structure
- ☒ Explanation of formulae and symbols -0.05
- ☒ Appropriate models, conformity of dimensions -0.15
- ☒ Slides, on-site experiments, audio, video, as appropriate +0.25
- ☒ References, proper citations of ideas and input of others +0.05
- ☒ Novelty of the report +0.05
- ☒ Contribution to the discussion

Final Grade: Reporter

7.0

Opp.: NIGERIA

PHILIP

5

Physics ±3

+0.25

- ☐ Correct and relevant physics
- ☒ Scientific approach +0.25
- ☐ Validity of conclusions
- ☐ Accurate answers

Presentation ±1

0

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

Opponent ±1

-0.25

- ☐ Response to the reporter's solution
- ☒ Shows the strong and weak points of the report -0.15
- ☒ Finds shortcomings or errors in the report
- ☐ Relevance of the questions
- ☒ Contribution to the discussion

Final Grade: Opponent

5.0

Rev.: HUNGARY

ANDRÁS LUKÓ

5

Physics ±3

+0.5

- ☒ Correct and relevant physics +0.15
- ☒ Scientific approach +0.15
- ☐ 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 +0.15
- ☒ Expresses own opinion about topics presented or discussed +0.15
- ☐ 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

6.0

Scoring Guidelines

Fight (Round no.): 1 Room: 8 Stage: 3 Problem no.: 13
 Juror: Kerry Parker Signature: Kerry 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.: Amin Deltali
Austria 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)? Lack of precision.
- ☐ Structure
- ☒ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☒ Slides, 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.: Philip Elushade
Nigeria 5

Physics ± 3 -1

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

Presentation ± 1 -

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

Opponent ± 1 -

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

Final Grade: Opponent 4

Rev.: Andras Lankó
Hungary 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

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 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.): 1 Room: 8 Stage: 3 Problem no.: 13
 Juror: GOLCHA JAVAN 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 -1

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

Presentation ± 1

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

Reporter ± 1 -1

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

Final Grade: Reporter 5

Opp.: 5

Physics ± 3 +1

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

Presentation ± 1

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

Opponent ± 1 -1

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

Final Grade: Opponent 5

Rev.: 5

Physics ± 3 +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 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 16 Wet and Dark Accepted.

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: 1 Problem no.: 16
 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.: Russia 5

Physics ± 3

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

Presentation ± 1

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

Reporter ± 1

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

Final Grade: Reporter

5

Opp.: Germany 5

Physics ± 3

- ☒ Correct and relevant physics
- ☒ 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

5

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

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: 1 Problem no.: 16
 Juror: ANDRÉ DABAR Signature: Pdu

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 -1

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

Presentation ± 1 0

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

Reporter ± 1 +0.5

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

Final Grade: Reporter

Opp.: 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

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.: 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

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.): 1 Room: 9 Stage: 1 Problem no.: 16
 Juror: Yung-Yuan Hsu. Signature: Yung-Yuan Hsu.

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 / Pavel
Kasray / Lombo 5

Physics ± 3 -1.5

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

Presentation ± 1 0.

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

Reporter ± 1 -1/3

- ☐ Quality of experimental technique(s) *base on path absorption, but can't explain diff. clothes result.*
- ☐ Structure
- ☐ Explanation of formulae and symbols
- ☐ Appropriate models, conformity of dimensions
- ☐ Slides, on-site experiments, audio, video, as appropriate
- ☐ References, proper citations of ideas and input of others *logic problems*
- ☐ Novelty of the report
- ☐ Contribution to the discussion

Final Grade: Reporter

Opp.: Germany / Kavit
Kavit 5

Physics ± 3 +1.5

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

Presentation ± 1 +1/3

- ☐ 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.: Russia / Panthan
Thailand / Jeerasakmakul 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

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

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: 1 Problem no.: 16
 Juror: Kim Freimann Signature: 

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 +0,3

- ☐ 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 4

Opp.: Germany 5

Physics ± 3 0,8

- ☒ 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 6

Rev.: Thailand 5

Physics ± 3 -0,4

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

Presentation ± 1 0

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

Reviewer ± 1 0,2

- ☒ 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 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.): I Room: 9 Stage: 1 Problem no.: 16
 Juror: Timoshchenko Signature: _____

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Russia

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.: Germany

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.: Thailand

5

Physics ± 3

0

- ☐ 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

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

Final Grade: Reviewer

5

Challenge problem 9 Hovercraft Rejected
7 Shaded Pole Rejected
3 Artificial muscle Rejected

Scoring Guidelines

Fight (Round no.): 9 Room: 9 Stage: 2 Problem no.: 3
Jury: G. Jennings 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.: Germany
Jonas Landgraf

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.: Thailand
Prian Pawakapan

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.: Russia
Vitali Maitunin

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

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 8

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: 11 Problem no.: 3
 Juror: PANOSKON DAEKAR Signature: Pan.

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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

0

- ☒ 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

5

Opp.: Thailand

5

Physics ± 3

0

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

Presentation ± 1

0

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

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.: Russia

5

Physics ± 3

+0.5

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

Presentation ± 1

0

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

Reviewer ± 1

+0.5

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

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

Final Grade: Reviewer

6

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: 2 Problem no.: 3
 Juror: Yung-Yuan Hsu Signature: Yung-Yuan Hsu

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Jonas Landgraf
Germany

5

Physics ± 3

0

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

Presentation ± 1

1/2

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

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

6

Opp.: Pi-an Pawakaporn
Thailand

5

Physics ± 3

0

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

Presentation ± 1

0

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

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

4.5

Rev.: Vitalii Morozov
Russia

5

Physics ± 3

+1

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

Presentation ± 1

0

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

Reviewer ± 1

1/2

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

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

Final Grade: Reviewer

7

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: 2 Problem no.: 3
 Juror: Kim Freimann Signature: 

A report should include:

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

An opposition should show that:

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

A review should show that:

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 +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 3

Opp.: Thailand 5

Physics ± 3 +1

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

Presentation ± 1 0

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

Opponent ± 1 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 0.5

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

Presentation ± 1 0

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

Reviewer ± 1 0.5

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

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

Final Grade: Reviewer 5

Scoring Guidelines

Fight (Round no.): I Room: 9 Stage: 2 Problem no.: 3
 Juror: Vinoshchenko 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 5

Physics ± 3 0

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

Presentation ± 1 0

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

Reporter ± 1 +0.6

- ☐ 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 6

Opp.: Thailand 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

- ☐ Response to the reporter's solution
- ☐ 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.: Russia 5

Physics ± 3 +2.0

- ☐ 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 8

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 15 Moving brush rejected
6 Magnus glider accepted.

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: 3 Problem no.: 6
Juror: G. Jennings Signature: RCS 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.: Thailand

Opp.: Russia

Rev.: Germany

Panithan Jeerasuwakul

Vitali Matinnin

Sina Hartung

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

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 2011-11-03

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: III Problem no.: 6
 Juror: PAVOŠKA ZACHAR Signature: Pav.

A report should include:

- a presentation of the appropriate concepts, theories and principles of the problem
- an explanation of the observed phenomena
- an application of appropriate mathematics
- reasonable experimental technique to gather and record data (or demonstrate the phenomena if appropriate)
- 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.: Thailand

5

Physics ± 3

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

-2

Presentation ± 1

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

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

2

Opp.: Russia

5

Physics ± 3

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

+2

Presentation ± 1

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

+1/4

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

+3/4

Final Grade: Opponent

8

Rev.: Germany

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

+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.): 1 Room: 9 Stage: 3 Problem no.: 6
 Juno: Yung-Yuan Hsu Signature: Yung-Yuan Hsu

A report should include:

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

An opposition should show that:

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

A review should show that:

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

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

Rep.: Panithan
Thailand

5

Physics ± 3

-2

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

Presentation ± 1

-1/3

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

Reporter ± 1

-3/3

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

Final Grade: Reporter

2

Opp.: Vitalii Martynov
Russia

5

Physics ± 3

1.5

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

Presentation ± 1

0.5

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

Opponent ± 1

2/3

- ☐ 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

8

Rev.: Sina Hartung
Germany

5

Physics ± 3

1.5

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

Presentation ± 1

0.5

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

Reviewer ± 1

2/3

- ☐ 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

8

Scoring Guidelines

Fight (Round no.): 1 Room: 7 Stage: 3 Problem no.: 6
 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.: Thailand

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

2

Opp.: 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

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

5

Rev.: Germany

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

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

8

Scoring Guidelines

Fight (Round no.): 1 Room: 9 Stage: 3 Problem no.: 6
 Juror: Vinodh Kumar 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 mathematical techniques to gather and record data (or demonstrate the phenomena if appropriate) • linking of theoretical and experimental findings to draw suitable conclusions • an attempt to communicate difficult or complex ideas in an effective and understandable manner	An opposition should show that: the opponent challenged the reporter's understanding of the presented concepts, theories and principles • the opponent understood the appropriate mathematics presented • the opponent critiqued the experimental technique used and questioned the validity of the data • the opponent appreciated and highlighted the strengths and weaknesses of the report	A review should show that: the reviewer succeeded in giving an objective summary of the performance of the reporter and opponent • the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematical methods used by the reporter and the opponent
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- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 -1

Presentation ± 1 0

Reporter ± 1 -1

Final Grade: Reporter 3

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers
- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Opp.: Russia 5

Physics ± 3 +1.5

Presentation ± 1 0

Opponent ± 1 +0.5

Final Grade: Opponent 7

- ☐ Correct and relevant physics
- ☐ Scientific approach
- ☐ Validity of conclusions
- ☐ Accurate answers
- ☐ Clear and understandable
- ☐ Appropriate manner
- ☐ Overall impression

Rev.: Germany 5

Physics ± 3 +1.5

Presentation ± 1 +0.5

Reviewer ± 1 +1

Final Grade: Reviewer 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

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

Round: 1 Room: 9 Fight Assistants:

Team	Stage 1			Stage 2			Stage 3			Stage 4		
	Russia	Germany	Thailand	Germany	Thailand	Russia	Thailand	Russia	Germany	Rep	Opp	Rev
Juror	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev	Rep	Opp	Rev
Gavin Jennings (chair)	5	6	5	6	5	8	3	7	7			
Dagmar Panosova	4	7	5	5	5	6	2	8	7			
Yung-Yuen Hsu	3	7	6	6	5	7	2	8	8			
Kim Freimann	4	6	5	3	6	5	2	5	8			
Igor Timoshchenko	6	7	5	6	4	8	~~2~~ 3	7	8			
Acting Team Member	Pavel Ianko	Carina Kanitz	Panithan Jeerasuwanakul	Jonas Landgraf	Pian Pauckapan	Vitalii Matiunin	Panithan Jeerasuwanakul	Vitalii Matiunin	Sina Hontung			
Rejected Problems	1			9, 7			15					
Accepted Problem	16			3			6					

Signature Fight Assistant: Double-checked with Scoring Guidelines by second Fight Assistant (signature):