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

Juror: Lobystv Signature: Blanker

#### A report should include:

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

## An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* the reviewer appreciated the *important aspects* (especially the *controversial* ones) the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) such personal opinions were *informative*, *non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts*, *theories*, *principles* and *appropriate mathematics* used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:5	Opp.:5	Rev.:5
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	Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols	☐ Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	☐ Relevance of the questions	☐ Draws attention to points missed
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others	11	This sheet will be collected by the fight assistant, so we can scan it and
☐ Novelty of the report		fight assistant, so we can archive your partial grades – please
☐ Contribution to the discussion		do not bend
		The control of the co

Final Grade: Reporter

Final Grade: Opponent

8

Final Grade: Reviewer

10

Fight (F	Roun	d no.): Final	Room:	AL	Stage:	P	roblem no.:	
Juror:	M	KUNESCH	<u> </u>	Signat	ure:	y	2	

## A report should include:

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

## An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

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

Rep.: Singa pone 5	Opp.: China 5	Rev.: <u>Poca - 5</u>
Physics ±3 f l	Physics ±3	Physics ±3
<ul> <li>□ Correct and relevant physics</li> <li>□ Scientific approach</li> <li>□ Validity of conclusions</li> </ul>	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions
☐ Accurate answers	Accurate answers	Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
☐ Clear and understandable + 0.7 ☐ Appropriate manner - a, e - g - a, e - g - a, e - g - a, e - a,	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression
Reporter ±1 0	Opponent ±1	Reviewer ±1 tas
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
Explanation of formulae and symbols	☐ Finds shortcomings or errors in	topics presented or discussed  Relevance of questions to both the
Appropriate models, conformity of dimensions	the report  Relevance of the questions	reporter and the opponent  Draws attention to points missed by the reporter or the opponent
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and fight assistant, and grades – please
☐ Novelty of the report		archive your partial groups
☐ Contribution to the discussion		do not bend
		The second contract of

		45000		B 1	8.0
CO	rina		IIA	0	lines
JUU	IIIIU	UU	Иu		11163

Fight (Round no.): R	oom: <u>A</u> Stage:	Problem no.: 1
Juror: S. By land	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

	o questions were posed or not finding shortc	omings if there were none to find.
Rep.: Singapore 5	Opp.: clara! 5	Rev.: Fraud 5
Physics ±3 +24	Physics ±3 + 1%	Physics ±3 + ½
☐ Correct and relevant physics	Correct and relevant physics	Correct and relevant physics
	☑ Scientific approach	☐ Scientific approach
	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	Accurate answers	☐ Accurate answers
Presentation ±1 +'ル	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 + 1/2	Opponent ±1 +1/2	Reviewer ±1 +1/2
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	☑ Expresses own opinion about
Explanation of formulae and symbols	of the report	topics presented or discussed
	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
Slides, on-site experiments, audio, video, as appropriate	☑ Contribution to the discussion	Draws attention to points missed by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		archive your partial glodes
☐ Contribution to the discussion		do not bend
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

Can.		P		1 _ 1	12	
Scol	ring	Gu	Ia	ei	Ine	25

Fight (R	ound no.): The	_ Room:	Stage:/	Problem no.:	
Juror:	L74222	Sign	ature: t-	· 1 ~	

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

## An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

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

<ul> <li>Don't punish missing 'answers' when n</li> </ul>	o questions were posed or not finding shortco	omings if there were none to find.
Rep.:	Opp.:	Rev.:
Physics ±3	Physics ±3	Physics ±3 + 2
☐ 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
- 5	Brosontation +1	
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
Reporter ±1  Quality of experimental technique(s)	Opponent ±1  Response to the reporter's solution	Reviewer ±1  Provides a thorough review of report and discussion
☐ Quality of experimental	Response to the reporter's solution  Shows the strong and weak points	Provides a thorough review of report and discussion
☐ Quality of experimental technique(s) ☐ Structure ☐ Explanation of formulae and	Response to the reporter's solution  Shows the strong and weak points of the report	☐ Provides a thorough review of
☐ Quality of experimental technique(s) ☐ Structure	Response to the reporter's solution  Shows the strong and weak points of the report  Finds shortcomings or errors in	□ Provides a thorough review of report and discussion □ Expresses own opinion about topics presented or discussed □ Relevance of questions to both the
☐ Quality of experimental technique(s) ☐ Structure ☐ Explanation of formulae and symbols ☐ Appropriate models, conformity	Response to the reporter's solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report	<ul> <li>□ Provides a thorough review of report and discussion</li> <li>□ Expresses own opinion about topics presented or discussed</li> <li>□ Relevance of questions to both the reporter and the opponent</li> </ul>
☐ Quality of experimental technique(s) ☐ Structure ☐ Explanation of formulae and symbols	Response to the reporter's solution  Shows the strong and weak points of the report  Finds shortcomings or errors in	□ Provides a thorough review of report and discussion □ Expresses own opinion about topics presented or discussed □ Relevance of questions to both the reporter and the opponent □ Draws attention to points missed by the reporter or the opponent
<ul> <li>☐ Quality of experimental technique(s)</li> <li>☐ Structure</li> <li>☐ Explanation of formulae and symbols</li> <li>☐ Appropriate models, conformity of dimensions</li> <li>☐ Slides, on-site experiments, audio,</li> </ul>	Response to the reporter's solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	Provides a thorough review of report and discussion  Expresses own opinion about topics 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
<ul> <li>☐ Quality of experimental technique(s)</li> <li>☐ Structure</li> <li>☐ Explanation of formulae and symbols</li> <li>☐ Appropriate models, conformity of dimensions</li> <li>☐ Slides, on-site experiments, audio, video, as appropriate</li> </ul>	Response to the reporter's solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	Provides a thorough review of report and discussion  Expresses own opinion about topics 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 fight assistant, so we can scan it and archive your partial grades – please archive your partial grades – please
□ Quality of experimental technique(s) □ Structure □ Explanation of formulae and symbols □ Appropriate models, conformity of dimensions □ Slides, on-site experiments, audio, video, as appropriate □ References, proper citations of ideas and input of others	Response to the reporter's solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	Provides a thorough review of report and discussion  Expresses own opinion about topics 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: Opponent

Final Grade: Reviewer

	- Wash	
Scoring Guidelii	165 Fight (Round no.): Final Room  Juror: Kathy Zealane	/ /
A report should include:		
a presentation of the appropriate concep application of appropriate mathematics • relations of appropriate mathematics • relations of the appropriate	ets, theories and principles of the problem • and easonable experimental technique to gather and experimental findings to draw suitable conclusions dable manner	record data (or demonstrate the phenomena if
An opposition should show that: • the opponent challenged the reporter's unappropriate mathematics presented • the opponent appreciated and highlighted the st	nderstanding of the presented concepts, theories pponent critiqued the experimental technique use	and <i>principles</i> • the opponent understood the ed and questioned the <i>validity</i> of the <i>data</i> • the
important aspects (especially the controvers	ctive summary of the performances the reporter sial ones) • the reviewer's personal opinion was in the reviewer's personal opinion was in the reporter and the opponent	n evidence (not just superficial observations) •
<ul> <li>The reporter, opponent and reviewer</li> <li>Consider the following suggestions to</li> <li>Select each partial grade from each see</li> </ul>	consists of a partial grade for physics, present each start with 5 points.  add to or deduct from the initial 5 points. In the corresponding box. In the questions were posed or not finding shorts.  Opp.:	
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
	Finds shortcomings or errors in the report	topics presented or discussed  Relevance of questions to both the reporter and the opponent
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	☐ Relevance of the questions	☐ Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent

Final Grade: Reporter

( Novelty of the report

References, proper citations of ideas and input of others

☐ Contribution to the discussion

Final Grade: Opponent

Final Grade: Reviewer

do not bend

This sheet will be collected by the

fight assistant, so we can scan it and archive your partial grades - please

Problem no.:

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

# A report should include:

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

# An opposition should show that:

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

#### A review should show that:

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

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

	ction and <i>write it</i> in the corresponding box. no questions were posed or not finding shortc	omings if there were none to find.	
Rep.: Singapore 5	Opp.: China 5	Rev.: Poland 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 0.6	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	
	Overdin impression	Overall impression	
Reporter ±1	Opponent ±1	Reviewer ±1	
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	<ul> <li>Provides a thorough review of report and discussion</li> </ul>	
☐ Structure	☐ Shows the strong and weak points	☐ Expresses own opinion about	
☐ Explanation of formulae and	of the report	topics presented or discussed	
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	and Appendix Country (Appendix Appendix Country Countr	
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	Draws attention to points missed by the reporter or the opponent	
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and	
☐ Novelty of the report		archive your partial grades	
☐ Contribution to the discussion		do not bend	
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer	

-	fore see all	,	4500		7 8		
6	CAVI	na	-	IIM	al	IM	no
_	cori	IIU	UL	4 I L.	CI	"	
		3					

Fight (Round no.): Find Room	: Stage:	Problem no.:
Juror: Kim F	Signature:	

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

# An opposition should show that:

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

#### A review should show that:

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

such personal opinions were informative, no principles and appropriate mathematics use	<b>on-trivial</b> and demonstrated, where possible, the red by the reporter and the opponent	eviewer's understanding of concepts, theories,
<ul> <li>The reporter, opponent and reviewer</li> <li>Consider the following suggestions to</li> <li>Select each partial grade from each se</li> </ul>	consists of a partial grade for <i>physics, present</i> each <i>start with 5 points</i> .  add to or <i>deduct</i> from the initial <i>5 points</i> .  action and <i>write it</i> in the corresponding box.  no questions were posed or not finding shorter	
Rep.: Singapore 5	Opp.: Clina 5	Rev.: Poland 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 $\pm 1$ $0 \le 1$
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
3 Structure	☐ Shows the strong and weak points	Expresses own opinion about topics presented or discussed
Explanation of formulae and symbols	of the report  Finds shortcomings or errors in	☐ Relevance of questions to both th
Appropriate models, conformity of dimensions the report  Relevance of the questions		reporter and the opponent  Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by and
Novelty of the report		archive your partial grades
Contribution to the discussion		do not bend
9	9	Production that have been desired to the broad a late of the second

Final Grade: Reporter

Final Grade: Opponent

Final Grade: Reviewer

rade: Reviewer \_\_\_\_\_dback and approved by EC on 2011-11-0

-				-					
31	COL	rın	a	(7		d	ρI	In	es
~			9	~	W I	W	<b>-</b> 1		

Fight (Round no.):	_ Room:	Stage: <b>1</b>	Problem no.: _	1_
Juror: OSTERWIER	Sign	ature: FQU	nin	

2020		5520		50 64	1
٨	report	chair	le i	inal	uda
м	IEDUIL	SHUU	ILCI		uue:

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

#### An opposition should show that:

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

#### A review should show that:

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

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

<ul> <li>Select each partial grade from each sec</li> </ul>	tion and write it in the corresponding box.	
	o questions were posed or not finding shortco	omings if there were none to find.
Rep.: Singapore 5	Opp.: China 5	Rev.: Bland 5
Physics ±3	Physics ±3	Physics ±3 +1/5
☐ Correct and relevant physics	Correct and relevant physics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach	☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	Accurate answers	Accurate answers
Presentation ±1 ਰਿਪਟ	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	Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols	☐ Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	☐ Relevance of the questions	☐ Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		fight assistant, so we con- archive your partial grades – please
☐ Contribution to the discussion	10	do not bend
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

	0 1 1 11	Fight (Round no.):	Room	:_ <i>H</i> _	Stage:
Scoring	Guidelines	Juror: G. Jenn	ings	Signature	:

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

## An opposition should show that:

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

#### A review should show that:

important aspects (especially the controvers	tive summary of the performances the reporter ial ones) • the reviewer's personal opinion was in n-trivial and demonstrated, where possible, the red by the reporter and the opponent	evidence (not just superficial observations) •
<ul> <li>The reporter, opponent and reviewer e</li> <li>Consider the following suggestions to e</li> <li>Select each partial grade from each sec</li> </ul>	consists of a partial grade for <i>physics</i> , <i>present</i> each <i>start with 5 points</i> .  add to or <i>deduct</i> from the initial <i>5 points</i> .  tion and <i>write it</i> in the corresponding box.  o questions were posed or not finding shortco	
Physics ±3 +2	Physics ±3 +1	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 0.5  Clear and understandable Appropriate manner Overall impression	Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	Presentation ±1 +0.5  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression
Reporter ±1 -0.5	Opponent ±1	Reviewer ±1
Quality of experimental technique(s)	Response to the reporter's solution	Provides a thorough review of report and discussion
Structure  Explanation of formulae and symbols	Shows the strong and weak points of the report  Finds shortcomings or errors in	Expresses own opinion about topics presented or discussed  Relevance of questions to both the
Appropriate models, conformity of dimensions  Slides, on-site experiments, audio, video, as appropriate	the report  Relevance of the questions  Contribution to the discussion	reporter and the opponent  Draws attention to points missed by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and
Novelty of the report		fight assistant, so we can archive your partial grades – please

Final Grade: Reporter

Contribution to the discussion

Final Grade: Opponent

Final Grade: Reviewer

do not bend

Problem no.:

SCO	rina	(-1)	IIde	olini	OC
	ring	UU	IIUC		

Fight (Round no.):	F_Room:	MH Stage: 1 Problem no.:
Juror: Thomas	Lindner	Signature: Maria Elle

A report should include:	ude	e:
--------------------------	-----	----

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

### An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

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

	tion and write it in the corresponding box.	
<ul> <li>Don't punish missing 'answers' when n</li> </ul>	o questions were posed or not finding shortco	omings if there were none to find.
Rep.: Singapore 5	Opp.: China 5	Rev.: Poland 5
Physics ±3 +2	Physics ±3 +2	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
		A Commence of the Commence of
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
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points	☐ Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols  Appropriate models, conformity	Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others	a -	This sheet will be collected by the fight assistant, so we can scan it and fight assistant, so we can scan it and
☐ Novelty of the report		archive your partial grades
☐ Contribution to the discussion		do not bend
		The ANNEAR AND

Final Grade: Opponent

Final Grade: Reviewer

c : c : ! !!	Fight (Round no.): Room: Stage: 2 Problem no.:	
Scoring Guidelines	Juror: Kyn MARTCHENKO Signature:	

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

## An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

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

<ul> <li>Don't punish missing 'answers' when n</li> </ul>	Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.						
Rep.: Singapoke 5	Opp.: China 5	Rev.: Poland 5					
Physics ±3 +2	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 + 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 $\pm 1$ $-2$	Opponent ±1 +\	Reviewer ±1					
179							
Quality of experimental technique(s)	Response to the reporter's solution	Provides a thorough review of report and discussion					
☐ Quality of experimental technique(s) ☐ Structure	solution  Shows the strong and weak points	report and discussion					
technique(s)  Structure  Explanation of formulae and	solution  Shows the strong and weak points of the report	report and discussion  Expresses own opinion about topics presented or discussed					
technique(s)  Structure  Explanation of formulae and symbols	solution  Shows the strong and weak points	report and discussion					
technique(s)  Structure  Explanation of formulae and	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in	report and discussion  Expresses own opinion about topics presented or discussed  Relevance of questions to both the reporter and the opponent					
technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report	report and discussion  Expresses own opinion about topics presented or discussed  Relevance of questions to both the reporter and the opponent  Draws attention to points missed by the reporter or the opponent					
technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio.	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	report and discussion  Expresses own opinion about topics 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					
technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio, video, as appropriate	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	report and discussion  Expresses own opinion about topics 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 fight assistant, so we can scan it and archive your partial grades – please					
technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio, video, as appropriate  References, proper citations of ideas and input of others	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	report and discussion  Expresses own opinion about topics presented or discussed  Relevance of questions to both the reporter and the opponent  Draws attention to points missed by the reporter or the opponent					

C		A	
Sco	rına	Guia	elines

			9		
Fight (Round no.):	Room:	Stage:	_	_ Problem ŋ <b>6</b> .:	
Juror: Lake &	Sign	ature:		Blokes	10
7 0099	3.8.	utu	- 4		-

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

# An opposition should show that:

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

#### A review should show that:

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

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

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

8

Final Grade: Reviewer

Con 2011-11-03

Fight (Round	d no.): Fina (	_Room:	AL	Stage:	3	Problem no.:	<u> </u>
Juror: M	KUNESCH	2,542	Signature	e: /	ue	- 2_	

#### A report should include:

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

#### An opposition should show that:

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

# A review should show that:

Final Grade: Reporter

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

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

Rep.: < 41. 5	Opp.: 6 (2)	Rev.: Storation 5
Physics ±3	Physics ±3	Physics ±3
☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions — Accurate answers ☐ 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 to.s	Presentation ±1 + 0s
☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  Carrai c	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression
Reporter ±1	Opponent ±1 + 0.5	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
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	☐ 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	The latest locate state the superior of
References, proper citations of ideas and input of others	-	This sheet will be collected by the
☐ Novelty of the report		archive your partial group
☐ Contribution to the discussion		do not bend

Final Grade: Opponent

Final Grade: Reviewer

Scoring Guide	linoc
Julina Gaine	IIIICS

Fight (Round no.): _	F	Room:	AH.	_ Stage: _	2	Problem no.:	5	
Juror: _ S . 39 (	and		Signatu	re:				

Revised after IOC feedback and approved b

## A report should include:

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

## An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.

The reporter, opponent and reviewer expensions to a	each start with 5 points.  add to or deduct from the initial 5 points.	•
	tion and write it in the corresponding box.	
	o questions were posed or not finding shortco	omings if there were some to find
pen i panish missing answers when h	questions were posed of not infamily shorted	omings it there were none to find.
Rep.: China	Opp.: Poland	Rev.: Stevalna
5	орр. <u>Гасесо</u> 5	Nev. Stevania 5
Physics ±3 +½	Physics ±3 +2	Physics ±3 +½
☐ 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
		the form of the state of the st
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 -½	Opponent ±1 +½	Reviewer ±1 +1/2
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	☑ Expresses own opinion about
Explanation of formulae and	of the report	topics presented or discussed
symbols	Finds shortcomings or errors in	Relevance of questions to both the
Appropriate models, conformity of dimensions	the report	reporter and the opponent
N. Santa Alexander Control of the Co	Relevance of the questions	Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others	9	This sheet will be collected by the
☑ Novelty of the report		fight assistant, so we can be archive your partial grades - please
TO THE TAXABLE STANDARD		do not bend
Contribution to the discussion		The state of the s
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer 6

C		C: -	I _ I :
SCO	rıng	Guia	lelines

Fight (Round no.):	Room:	Stage:	2_	Problem no.: <sub>-</sub>	3
Juror: K ZADLO	Sign	ature: K	- 	4	

#### A report should include:

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

## An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.

Don't punish missing 'answers' when no	questions were posed or not finding shorted	omings if there were none to find.
Rep.: _ C	Opp.:	Rev.: 5
Physics ±3	Physics ±3	Physics ±3 Z
☐ 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	Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols  Appropriate models, conformity	Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		archive your partial Broad
☐ Contribution to the discussion		do not bend
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

SCC	ring	(-1	uda	olin	PC
	,,,,,,	U	IIU	-	

Fight (Round no.): Final Room: \_\_\_\_\_ Stage: \_\_\_\_ Problem no.: \_\_\_\_\_ 5

Juror: Kathrun Zealand Signature: Kathrun Zealand Signatur

### A report should include:

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

## An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

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

	o questions were posed or not finding shortco	omings if there were none to find.
Rep.: <u>Liu</u> 5	Opp.: Radof 5	Rev.: Nath 110 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 ±2	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
beautiful videos	2002	
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	☐ Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols	Finds shortcomings or errors in the report	☐ Relevance of guestions to both the
☐ Appropriate models, conformity		reporter and the opponent
of dimensions	— material to 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	The state of the s
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		fight assistant, so we can be archive your partial grades – please
☐ Contribution to the discussion		do not bend
A	0:	The Contraction of the Contracti

Final Grade: Opponent

Final Grade: Reviewer

_		Fight (Round no.):	Room	: Stage: <b>2</b>	Problem no
Scoring	Guidelines	Juror: Rapun	Monyum	Signature: 7	Manyeun

AI	rep	ort	should	inc	lude:
----	-----	-----	--------	-----	-------

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

## An opposition should show that:

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

### A review should show that:

Final Grade: Reporter

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

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

- Don't punish missing answers when h	o duestions were posed or not finding shorter	omings if there were none to find.
Rep.: China 5	Opp.: Bland 5	Rev.: 8lomkia 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 ••5
☐ Clear and understandable	Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	☐ Appropriate manner	☐ Appropriate manner
Overall impression	Overall impression	Overall impression
Reporter ±1  o·5	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	☐ Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols —	☐ Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	☐ Relevance of the questions	☐ Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		archive your partial grades
☐ Contribution to the discussion		do not bend
	**	And the second s

Final Grade: Opponent

Final Grade: Reviewer

Fight (Round no.): Fral Room	:Stage:	2 Problem no.:	5
Juror: Kim F	Signature:		

Final Grade: Reviewer

# A report should include:

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

# An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* the reviewer appreciated the *important aspects* (especially the *controversial* ones) the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) such personal opinions were *informative*, *non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts*, *theories*, *principles and appropriate mathematics* used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.

<ul> <li>Don't punish missing 'answers' when n</li> </ul>	o questions were posed or not finding shortco	omings if there were none to find.
Rep.: China 5	Opp.: Poland 5	Rev.: Slovalda 5
Physics ±3	Physics ±3 +1	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 0,5	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	☐ Expresses own opinion about
Explanation of formulae and	of the report	topics presented or discussed
symbols  Appropriate models, conformity	Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and
☐ Novelty of the report		archive your partial grade
☐ Contribution to the discussion		do not bend

Sco	ring	Gu	ide	oli	inoc
JUU	illig	Uu	IUC		1163

Fight (Round no.): F Room: Stage: Problem no.: 5

### A report should include:

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

## An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

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

<ul> <li>Don't punish missing 'answers' when n</li> </ul>	o questions were posed or not finding short	comings if there were none to find.
Rep.: China 5	Opp.: Bland 5	Rev.: Slovatia 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 0
Clear and understandable	Clear and understandable	Clear and understandable
☐ Appropriate manner	Appropriate manner	☐ Appropriate manner
☐ Overall impression	Overall impression	Overall impression
Reporter ±1 O	Opponent ±1	Reviewer ±1
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	<ul> <li>Provides a thorough review of report and discussion</li> </ul>
☐ Structure	☐ Shows the strong and weak points	Expresses own opinion about topics presented or discussed
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols —	Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	☐ Relevance of the questions	A STATE OF THE STA
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	Draws attention to points missed by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		fight assistant, so we can be archive your partial grades – please
2		
☐ Contribution to the discussion		do not bend

	FI.	: <u>A</u> Stage: <u>2</u> Problem no.: <u>5</u>
Scoring Guidelin	Juror: F. Jennings	25
A report should include:	1980	,
application of appropriate mathematics • rea	s, theories and principles of the problem • an exasonable experimental technique to gather and reperimental findings to draw suitable conclusionable manner	ecord data (or demonstrate the phenomena if
	derstanding of the presented concepts, theories a ponent critiqued the experimental technique used engths and weaknesses of the report	
important aspects (especially the controversi	tive summary of the performances the reporter a ial ones) • the reviewer's personal opinion was in n-trivial and demonstrated, where possible, the re by the reporter and the opponent	evidence (not just superficial observations) •
<ul> <li>The reporter, opponent and reviewer e</li> <li>Consider the following suggestions to a</li> <li>Select each partial grade from each sec</li> </ul>	consists of a partial grade for physics, present each start with 5 points. add to or deduct from the initial 5 points. tion and write it in the corresponding box. or questions were posed or not finding shortco	
Physics ±3	Physics ±3	Physics ±3 +1
☐ Correct and relevant physics	☑ Correct and relevant physics	☑ Correct and relevant physics
☐ Scientific approach	☑ Scientific approach	Scientific approach
☐ Validity of conclusions	Validity of conclusions	☐ Validity of conclusions
☐ Accurate answers	🗵 Accurate answers	Accurate answers
Presentation ±1 +03	Presentation ±1 +0.5	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 +0.25	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	Expresses own opinion about
Explanation of formulae and	of the report	topics presented or discussed
symbols  Appropriate models, conformity	☐ Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
of dimensions	Relevance of the questions	Draws attention to points missed by the reporter or the opponent

Final Grade: Reporter

Slides, on-site experiments, audio, video, as appropriate

References, proper citations of ideas and input of others

Contribution to the discussion \_

Novelty of the report

Final Grade: Opponent

☐ Contribution to the discussion

Final Grade: Reviewer Revised after IOC feedback and approved by EC on 2011-11-03

do not bend

This sheet will be collected by the

fight assistant, so we can scan it and archive your partial grades - please

Sco	rina	Guide	lines

Fight (Round no.): F Room: 14 Stage: 2 Problem no.: 5

Juror: Mounds Lindner Signature: Mallo S Mins

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

### A report should include:

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

## An opposition should show that:

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

#### A review should show that:

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

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

Select each partial grade from each sect	tion and write it in the corresponding box.  o questions were posed or not finding shortco	omings if there were none to find.
Rep.: China 5	Opp.: Poland 5	Rev.: Slovalia 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 0,5	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	☐ Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols	Finds shortcomings or errors in the report	Relevance of questions to both the
Appropriate models, conformity of dimensions	Relevance of the questions	reporter and the opponent  Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and
☐ Novelty of the report		fight assistant, so we com- archive your partial grades - please
☐ Contribution to the discussion		do not bend
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

~		-	0 8	80
500	OVIN/	4 (-1	IINO	lines
JU	JIIIIU	I $U$ $L$	MUC	IIIICS

Fight (Round no.): F Room: Stage: 2 Problem no.: 5

Juror: Lya MARTCHEN Signature:

Final Grade: Reviewer

## A report should include:

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

#### An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* the reviewer appreciated the *important aspects* (especially the *controversial* ones) the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) such personal opinions were *informative*, *non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts*, *theories*, *principles and appropriate mathematics* used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.

Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.			
Rep.: Che na 5	Opp.: Poland 5	Rev.: Slovelia 5	
Physics ±3 +2	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	
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	<ul> <li>Provides a thorough review of report and discussion</li> </ul>	
☐ Structure	Shows the strong and weak points of the report	Expresses own opinion about topics presented or discussed	
<ul> <li>Explanation of formulae and symbols</li> </ul>	Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent	
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	Relevance of the questions	☐ Draws attention to points missed	
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent	
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and	
☐ Novelty of the report		archive your partial state	
☐ Contribution to the discussion		do not bend	

Fight (Ro	und no.): <u>+</u>	Room:	Stage:	3 Problem p	0.:
Juror:	Loky	She V Sign	ature:	Blake	4

#### A report should include:

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* the reviewer appreciated the *important aspects* (especially the *controversial* ones) the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) such personal opinions were *informative*, *non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts*, *theories*, *principles* and *appropriate mathematics* used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.
- · Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.:5	Opp.:5	Rev.:
Physics ±3	Physics ±3	Physics ±3
<ul> <li>□ Correct and relevant physics</li> <li>□ Scientific approach</li> <li>□ Validity of conclusions</li> <li>□ Accurate answers</li> </ul>	<ul> <li>☐ Correct and relevant physics</li> <li>☐ Scientific approach</li> <li>☐ Validity of conclusions</li> <li>☐ Accurate answers</li> </ul>	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers
Presentation ±1	Presentation ±1	Presentation ±1
<ul> <li>☐ Clear and understandable</li> <li>☐ Appropriate manner</li> <li>☐ Overall impression</li> </ul>	☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression	<ul><li>☐ Clear and understandable</li><li>☐ Appropriate manner</li><li>☐ Overall impression</li></ul>
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	☐ Expresses own opinion about
Explanation of formulae and symbols	of the report  Finds shortcomings or errors in the report	topics presented or discussed  Relevance of questions to both the reporter and the opponent
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	☐ Relevance of the questions	☐ Draws attention to points missed
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		archive your partial group
☐ Contribution to the discussion		do not bend

Final Grade: Reporter

Final Grade: Opponent

7

Final Grade: Reviewer

FC on 2011 11 02

Fight (Round no.): Final Room: 4 Stage: 3 Problem no.: 2

Juror: M KUNESCH Signature: 3

# A report should include:

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

## An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* the reviewer appreciated the *important aspects* (especially the *controversial* ones) the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) such personal opinions were *informative*, *non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts*, *theories*, *principles* and *appropriate mathematics* used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.
- · Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.

Rep.: <u>Poland</u> 5	Opp.: Slova 4: a 5	Rev.: Singapore 5
Physics ±3	Physics ±3 + 2	Physics ±3
☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers  Presentation ±1 ☐ Clear and understandable *0.5 ☐ Appropriate manner ☐ Overall impression  Reporter ±1	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers  Presentation ±1 ☐ Clear and understandable + 0.5 ☐ Appropriate manner - 0.5 ☐ Overall impression  Opponent ±1	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers  Presentation ±1 ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  Reviewer ±1  → Cost
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	☐ Expresses own opinion about
<ul> <li>Explanation of formulae and symbols</li> </ul>	of the report  Finds shortcomings or errors in	topics presented or discussed  Relevance of questions to both the
Appropriate models, conformity of dimensions	the report  Relevance of the questions	reporter and the opponent  Draws attention to points missed
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and
☐ Novelty of the report		archive your partial grades
☐ Contribution to the discussion		do not bend

Final Grade: Opponent

Final Grade: Reviewer

C feedback and approved by EC on 2011-11-03

		<i>→</i> 3 /	1 110
	NINA		alinac
JLU	IIIIIU	Guiu	elines

Canada a Cadalali	Fight (Round no.): _ — _ F	Room: Att Stage: 3 Problem no.: 2
Scoring Guideli	nes Juror: S. By Land	Signature: V. By S
application of appropriate mathematics •	reasonable experimental technique to gather experimental findings to draw suitable conc	an explanation of the observed phenomena • an and record data (or demonstrate the phenomena if clusions • an attempt to communicate difficult or
An opposition should show that	2.	
• the opponent <i>challenged</i> the <i>reporter's appropriate mathematics</i> presented • the opponent appreciated and highlighted the s	opponent critiqued the experimental technique	ries and principles • the opponent understood the e used and questioned the validity of the data • the
A review should show that:	1000000	
important aspects (especially the controver	rsial ones) • the reviewer's personal opinion won-trivial and demonstrated, where possible, t	rter and opponent • the reviewer appreciated the vas in evidence (not just superficial observations) • the reviewer's understanding of concepts, theories,
The reporter, opponent and reviewer Consider the following suggestions to Select each partial grade from each se	s consists of a partial grade for <i>physics, pre</i> each <i>start with 5 points</i> .  a <i>add</i> to or <i>deduct</i> from the initial <i>5 points</i> , ection and <i>write it</i> in the corresponding bo no questions were posed or not finding sho	<b>x</b> .
Rep.: Palaud 5	Opp.: Slovaluz 5	Rev.: Sryapae 5
hysics ±3	Physics ±3	Physics ±3 +2
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
LIL LAND		
resentation ±1	Presentation ±1	Presentation ±1
Clear and understandable	Clear and understandable	Clear and understandable
Appropriate manner		Appropriate manner

Physics ±3	+1/
Correct and relevant ph	ysics
☐ Scientific approach	Areba oppositelja Projekto positelja
☐ Validity of conclusions	
☐ Accurate answers	
Presentation ±1	+ 1/2
☐ Clear and understandab	le .
□ Appropriate manner	
Overall impression	1/
Reporter ±1	+ 1/2
Quality of experimental technique(s)	
☐ Structure	S
<ul> <li>Explanation of formulae symbols</li> </ul>	and
Appropriate models, con of dimensions	formity
☑ Slides, on-site experimen	ts audio

video, as appropriate

References, proper citations of ideas and input of others Novelty of the report

☑ Contribution to the discussion

Final Grade: Reporter

	Physics ±3	Physics ±3 +2
	☐ Correct and relevant physics	☐ Correct and relevant physics
	☐ Scientific approach	☐ Scientific approach
	☐ Validity of conclusions	☐ Validity of conclusions
110	Accurate answers	Accurate answers
		A compression of the control of the
75	Presentation ±1	Presentation ±1
	Clear and understandable	☐ Clear and understandable
	Appropriate manner	Appropriate manner
	Overall impression	Overall impression
3	Opponent ±1	Reviewer ±1 +½
	Response to the reporter's solution	Provides a thorough review of report and discussion
	Shows the strong and weak points of the report	Expresses own opinion about topics presented or discussed
	Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
	Relevance of the questions	□ Draws attention to points missed
90	☐ Contribution to the discussion	by the reporter or the opponent
		This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend

Final Grade: Reviewer Revised after IOC feedback and approved by EC on 2011-11-03

Coordina Cividalinas	Fight (Round no.):	Room: Sta	nge: Problem no.:	_<
Scoring Guidelines	Juror: KZABLO	Signature: _	Korton	

I

# A report should include:

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

#### An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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 =
кер.:5	<b>ОРР</b> 5	Nev 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
	Buscontation ±1	
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 Ø	Reviewer ±1
Quality of experimental technique(s)	Response to the reporter's solution	<ul> <li>Provides a thorough review of report and discussion</li> </ul>
☐ Structure	☐ Shows the strong and weak points	☐ Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
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
The Hallington of Theoretic States		by the reporter or the opponent
<ul> <li>Slides, on-site experiments, audio, video, as appropriate</li> </ul>	☐ Contribution to the discussion	and the state of t
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		archive your partial allow
☐ Contribution to the discussion		da not bend

Final Grade: Opponent

Final Grade: Reviewer

6 6	Fight (Round no.): Fhal Roor	n: Stage: Problem no.:
Scoring Guidelii	nes Juror: Kathyn Clalan	n: Stage: Problem no.:
A report should include:		
application of appropriate mathematics • r	ots, theories and principles of the problem • an eleasonable experimental technique to gather and experimental findings to draw suitable conclusion adable manner	record data (or demonstrate the phenomena if
An opposition should show that: • the opponent challenged the reporter's unappropriate mathematics presented • the opponent appreciated and highlighted the st	nderstanding of the presented concepts, theories pponent critiqued the experimental technique use	and <i>principles</i> • the opponent understood the ed and questioned the <i>validity</i> of the <i>data</i> • the
A review should show that:		
important aspects (especially the controver	ctive summary of the performances the reporter sial ones) • the reviewer's personal opinion was in on-trivial and demonstrated, where possible, the read by the reporter and the opponent	n evidence (not just superficial observations) •
<ul> <li>The reporter, opponent and reviewer</li> <li>Consider the following suggestions to</li> <li>Select each partial grade from each see</li> </ul>	consists of a partial grade for <i>physics</i> , <i>present</i> each <i>start with 5 points</i> . <i>add</i> to or <i>deduct</i> from the initial <i>5 points</i> .  ction and <i>write it</i> in the corresponding box.  no questions were posed or not finding shorton	
Rep.: Tynoleus 5	Opp.: Jakb 5	Rev.:
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 -watch	☐ Appropriate manner
Overall impression	Overall impression	Overall impression
Reporter ±1 O	Opponent ±1 +	Reviewer ±1 + ½
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	
<ul> <li>Explanation of formulae and symbols</li> </ul>	of the report  Finds shortcomings or errors in	Expresses own opinion about topics presented or discussed  Relevance of questions to both the
Appropriate models conformity	the report	reporter and the opponent

Slides, on-site experiments, audio, Contribution to the discussion video, as appropriate References, proper citations of ideas and input of others

Relevance of the questions

Appropriate models, conformity of dimensions

☐ Novelty of the report

Contribution to the discussion

This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades - please

Draws attention to points missed by the reporter or the opponent

do not bend

Final Grade: Opponent Final Grade: Reporter

Final Grade: Reviewer Revised after IOC feedback and approved by EC on 2011-11-03

Scoring	Guidelines	4
Juding	Guidelliles	

Fight (Round no.): Room:	Stage: Problem no.:
Juror: Propun Manyum Signa	ture: P. Mayum

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.

Don't punish missing 'answers' when h	o questions were posed or not finding shortc	omings if there were none to find.
Rep.: Dand 5	Opp.: Sameia 5	Rev.: Singpan 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
0.5	Presentation +1	A company but
Presentation ±1	Trescritation II	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 0.5	Opponent ±1	Reviewer ±1
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	Provides a thorough review of report and discussion
<ul><li>☐ Quality of experimental technique(s)</li><li>☐ Structure</li></ul>	solution  Shows the strong and weak points	Expresses own opinion about
technique(s)  Structure  Explanation of formulae and	solution  Shows the strong and weak points of the report	William Communication Communic
technique(s)  Structure	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in	Expresses own opinion about topics presented or discussed  Relevance of questions to both the
technique(s)  Structure  Explanation of formulae and	solution  Shows the strong and weak points of the report	<ul> <li>Expresses own opinion about topics presented or discussed</li> <li>Relevance of questions to both the reporter and the opponent</li> <li>Draws attention to points missed</li> </ul>
technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report	□ Expresses own opinion about topics presented or discussed □ Relevance of questions to both the reporter and the opponent □ Draws attention to points missed by the reporter or the opponent
technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio,	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	□ Expresses own opinion about topics 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
technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio, video, as appropriate	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	Expresses own opinion about topics 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 fight assistant, so we can scan it and archive your partial grades — please
technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio, video, as appropriate  References, proper citations of ideas and input of others	solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions	Expresses own opinion about topics 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

Fight (Round no.): Hina	: Stage:	3	Problem no.: 2
Juror: Kim F	Signature:	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:

Final Grade: Reporter

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.

	o questions were posed or not finding shortco	omings if there were none to find.
Rep.: Poland 5	Opp.: Slovalia 5	Rev.: Singe pore 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	100
		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	Reviewer ±1 +0.5
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points	☐ Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols	Finds shortcomings or errors in the report	Relevance of questions to both the
Appropriate models, conformity of dimensions	Relevance of the guestions	reporter and the opponent
☐ Slides, on-site experiments, audio.	Contribution to the discussion	Draws attention to points missed by the reporter or the opponent
video, as appropriate		and the second s
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and
☐ Novelty of the report		archive your partial brush
☐ Contribution to the discussion	_	do not bend
<del>                                      </del>		And the state of t

Final Grade: Opponent

Final Grade: Reviewer

^			5 g		
SCO	ring	(-11	IIde	lin	PC
JUU	IIII	UU	IUL		

Fight (Round no.):	_ Room:	Stage: <b>3</b>	_ Problem no.:	2
DETERIALIER	6.	I COL		

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

#### An opposition should show that:

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

### A review should show that:

Final Grade: Reporter

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

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

<ul> <li>Don't punish missing 'answers' when n</li> </ul>	o questions were posed or not finding shorte	omings if there were none to mid.
Rep.: Poland 5	Opp.: Slovatia 5	Rev.: Singapore 5
Physics ±3	Physics ±3 +C175	Physics ±3
<ul> <li>□ Correct and relevant physics</li> <li>□ Scientific approach</li> <li>□ Validity of conclusions</li> <li>□ Accurate answers</li> </ul>	☐ 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	<ul><li>☐ Clear and understandable</li><li>☐ Appropriate manner</li><li>☐ Overall impression</li></ul>
Reporter ±1 +075	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
Pi		roportor and the enneanest
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	Relevance of the questions	reporter and the opponent  Draws attention to points missed
<ul> <li>□ Appropriate models, conformity of dimensions</li> <li>□ Slides, on-site experiments, audio, video, as appropriate</li> </ul>		Draws attention to points missed by the reporter or the opponent
of dimensions  Slides, on-site experiments, audio,	☐ Relevance of the questions	Draws attention to points missed by the reporter or the opponent  This sheet will be collected by the
of dimensions  Slides, on-site experiments, audio, video, as appropriate	☐ Relevance of the questions	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
of dimensions  Slides, on-site experiments, audio, video, as appropriate  References, proper citations of ideas and input of others	☐ Relevance of the questions	Draws attention to points missed by the reporter or the opponent

Scaring Guidalinas	Fight (Round no.): Trad Room: A Stage: S Problem no.:
scoring Guidennes	Juror: _ Co. Jennings. Signature:

A	report	shoul	d inc	lude:

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

## An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.

	tion and write it in the corresponding box. o questions were posed or not finding shorte	omings if there were none to find
Rep.: Poland 5	Opp.: Slovakia 5	Rev.: Singapore 5
Physics ±3 +1	Physics ±3 +/-5	Physics ±3 +2
☐ 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	Presentation ±1 + \
☐ Clear and understandable	O+Clear and understandable	☐ Clear and understandable
☐ Appropriate manner	Appropriate manner	☐ Appropriate manner
Overall impression	Overall impression	Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1 + 110
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	☐ Expresses own opinion about
Explanation of formulae and	of the report	topics presented or discussed
symbols  Appropriate models, conformity	Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
of dimensions	$\square$ Relevance of the questions	☐ Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and fight assistant, and grades – please
		fight assistant, so we con- archive your partial grades – please
Contribution to the discussion		do not bend
,		The second secon

Final Grade: Opponent

Final Grade: Reviewer

Fight (Round no.): T Room: WH Stage: 3 Problem no.:

Juror: Moungs Lindner Signature: Muses Miles

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

# A report should include:

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

## An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for *physics*, *presentation* and for their *specific role*.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.

Don't punish missing answers when no	questions were posed or not finding shortco	omings if there were none to find.
Rep.: Poland 5	Opp.: Sovahia 5	Rev.: Singapore 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 -0,5	Opponent ±1	Reviewer ±1
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points	☐ Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols  Appropriate models, conformity	Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and
☐ Novelty of the report		archive your partial grades
☐ Contribution to the discussion		do not bend
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

Fight (Round no.): From: Stage: 3 Problem no.: 2

Juror: Was MARTCHE NEO 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.

<ul> <li>Don't punish missing 'answers' when no</li> </ul>	questions were posed or not finding shortco	mings if there were none to find.
Rep.: Poland 5	Opp.: Slovalia 5	Rev.: Singerpore 5
Physics ±3	Physics ±3	Physics ±3 ±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
<ul> <li>Appropriate models, conformity of dimensions</li> </ul>	Relevance of the questions	☐ Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and
☐ Novelty of the report		fight assistant, so we can obtain a fight assistant, and a fight assistant a fight a fight assistant a fight as fight a fight assistant a fight a fight a fight as fight as fight a fight a fight a fight as fight a fight a fight as fight a
☐ Contribution to the discussion		do not bend
Final Grade: Reporter	Final Grade: Opponent Revised	Final Grade: Reviewer after IOC feedback and approved by EC on 2011-11-03

Cooring Coridalis	Fight (Round no.): Room: Stag	e: Problem no.:
Scoring Guidelines	Juror: Kya MARTCHENKO Signature:	Tr

Are	port	shou	ld i	nch	ide:

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

## An opposition should show that:

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

#### A review should show that:

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

principles and appropriate mathematics used	by the reporter and the opponent	Q
<ul> <li>The reporter, opponent and reviewer e</li> <li>Consider the following suggestions to e</li> <li>Select each partial grade from each sec</li> </ul>	consists of a partial grade for <i>physics</i> , <i>present</i> each <i>start with 5 points</i> .  add to or <i>deduct</i> from the initial <i>5 points</i> .  Ition and <i>write it</i> in the corresponding box.  To questions were posed or not finding shortco	
Rep.: Govakeo 5	Opp.: Singapore 5	Rev.: China 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 4 4 - 1
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points	☐ Expresses own opinion about
<ul> <li>Explanation of formulae and symbols</li> </ul>	of the report  Finds shortcomings or errors in	topics presented or discussed  Relevance of questions to both the
Appropriate models, conformity of dimensions	the report	reporter and the opponent
Slides, on-site experiments, audio, video, as appropriate	☐ Relevance of the questions ☐ Contribution to the discussion	Draws attention to points missed by the reporter or the opponent
References, proper citations of ideas and input of others	er er	This sheet will be collected by the fight assistant, so we can scan it and
☐ Novelty of the report		fight assistant, so we are archive your partial grades – please
☐ Contribution to the discussion		do not bend
Final Grade: Reporter	Final Grade: Opponent	Final Grade: Reviewer

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

		Fight (Round no.):	Room:UT	Stage:l Problem r
Scoring	Guidelines	Juror: Momas Lin	udhes Signatu	re: Mouras ff

1/11

4

corning Guideni	Juror: Momas Lindher	Signature: Mulay ff
application of appropriate mathematics •	pts, theories and principles of the problem • an experimental technique to gather and reexperimental findings to draw suitable conclusion and able manner	ecord data (or demonstrate the phenomena if
	understanding of the presented concepts, theories a opponent critiqued the experimental technique used	
important aspects (especially the controve	ective summary of the performances the reporter a rsial ones) • the reviewer's personal opinion was in non-trivial and demonstrated, where possible, the re ed by the reporter and the opponent	evidence (not just superficial observations) •
The reporter, opponent and reviewer Consider the following suggestions to Select each partial grade from each se	s consists of a partial grade for <i>physics, present</i> reach <i>start with 5 points</i> .  o add to or <i>deduct</i> from the initial <i>5 points</i> .  ection and <i>write it</i> in the corresponding box.  no questions were posed or not finding shortco	
hysics ±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
resentation ±1 0,5	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
eporter ±1 0,5	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 Appropriate models, conformity of dimensions Slides, on-site experiments, audio, video, as appropriate

References, proper citations of ideas and input of others

Novelty of the report

Final Grade: Reporter

☐ Contribution to the discussion

Final Grade: Opponent

the report

Finds shortcomings or errors in

☐ Relevance of the questions

☐ Contribution to the discussion

Final Grade: Reviewer Revised after IOC feedback and approved by EC on 2011-11-03

do not bend

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

Fight (Round no.): Final Room: A Stage: 4 Problem no.: 16.

Juror: G. Jenning Signature: Bright

Final Grade: Reviewer

## A report should include:

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

## An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.

<ul> <li>Select each partial grade from each sec</li> </ul>	add to or deduct from the initial 5 points. tion and write it in the corresponding box. o questions were posed or not finding shortco	omings if there were none to find.
Rep.: Slovallia 5	Opp.: Singapore 5	Rev.: China 5
Physics ±3 +2	Physics ±3 +2	Physics ±3
☐ Correct and relevant physics	Correct and relevant physics	O 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 + 0.	Presentation ±1
☑ Clear and understandable	☐ Clear and understandable	O Clear and understandable
☐ Appropriate manner	Appropriate manner	Appropriate manner
Overall impression	Overall impression	Overall impression
Reporter ±1	Opponent ±1 + 0.5	Reviewer ±1 – 0 以
☑ 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	<ul> <li>Expresses own opinion about</li> </ul>
Explanation of formulae and	of the report	topics presented or discussed
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	
Slides, on-site experiments, audio, video, as appropriate	Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the
Novelty of the report		fight assistant, so we car archive your partial grades – please
		do not bend

_		A . I	
SCO	rina	(-IIII	elines
	IIII	UUIU	CIIIICS

Fight (Round no.): Room:	Stage:	4 Problem no.:	16
Juror: Kim F	Signature:		

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

#### An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* the reviewer appreciated the *important aspects* (especially the *controversial* ones) the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) such personal opinions were *informative*, *non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts*, *theories*, *principles and appropriate mathematics* used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in the corresponding box.

	tion and write it in the corresponding box. o questions were posed or not finding shortco	omings if there were none to find.
Rep.: Slovata 5	Opp.: Angapore 5	Rev.: Clina 5
Physics ±3	Physics ±3 +2	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 0,5	Opponent ±1	Reviewer ±1
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points	☐ Expresses own opinion about
☐ Explanation of formulae and	of the report	topics presented or discussed
symbols  Appropriate models, conformity	☐ Finds shortcomings or errors in the report	Relevance of questions to both the reporter and the opponent
of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and fight assistant, and grades – please
☐ Novelty of the report		archive your partial grades
☐ Contribution to the discussion		do not bend
		2

Final Grade: Opponent

Final Grade: Reviewer

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

Scoring Guideli	Fight (Round no.):	E Age	m: Stage: Problem no.:
A report should include:			
a presentation of the appropriate conce, application of appropriate mathematics •	reasonable experimental technique t experimental findings to draw suite	o <i>gather</i> and	explanation of the observed phenomena • an record data (or demonstrate the phenomena if ons • an attempt to communicate difficult or
An opposition should show that • the opponent challenged the reporter's unappropriate mathematics presented • the component appreciated and highlighted the second component appreciated and highlighted appreciated and highlighted and highlighted appreciated and highlighted and highlighte	anderstanding of the presented conce opponent critiqued the experimental	<b>technique</b> use	and <i>principles</i> • the opponent understood the ed and questioned the <i>validity</i> of the <i>data</i> • the
important aspects (especially the controver	rsial ones) • the reviewer's personal on- con-trivial and demonstrated, where p	opinion was in	and opponent • the reviewer appreciated the n evidence (not just superficial observations) • eviewer's understanding of concepts, theories,
<ul> <li>The grade for each of the three teams</li> <li>The reporter, opponent and reviewer</li> <li>Consider the following suggestions to</li> <li>Select each partial grade from each se</li> <li>Don't punish missing 'answers' when</li> </ul>	each start with 5 points. add to or deduct from the initial action and write it in the correspon	<i>5 points.</i> nding box.	
Rep.: Slowkia 5	Opp.: Singapon	5	Rev.: China. 5
Physics ±3	Physics ±3	2	Physics ±3
☐ Correct and relevant physics	☐ Correct and relevant ph	ysics	☐ Correct and relevant physics
☐ Scientific approach	☐ Scientific approach		☐ Scientific approach
☐ Validity of conclusions	☐ Validity of conclusions		☐ Validity of conclusions
☐ Accurate answers	Accurate answers	₹ <sub>1</sub> ,	☐ Accurate answers
Presentation ±1	Presentation ±1		Presentation ±1
☐ Clear and understandable	☐ Clear and understandab	lo.	☐ Clear and understandable
☐ Appropriate manner	Appropriate manner	ie ,	Appropriate manner
Overall impression	Overall impression	7	Overall impression
Reporter ±1 a5	Opponent ±1	1	Reviewer ±1
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporte solution	r's	Provides a thorough review of report and discussion
☐ Structure	Shows the strong and we of the report	eak points	Expresses own opinion about
<ul> <li>Explanation of formulae and symbols</li> </ul>	☐ Finds shortcomings or er	rors in	topics presented or discussed  Relevance of questions to both the
Appropriate models, conformity of dimensions	the report  Relevance of the question	ns	reporter and the opponent  Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discu		by the reporter or the opponent
References, proper citations of ideas and input of others			This sheet will be collected by the
☐ Novelty of the report			fight assistant, so we can be archive your partial grades — please

Final Grade: Opponent Final Grade: Reviewer Revised after IOC feedback and approved by EC on 2011-11-03

 $\hfill \square$  Contribution to the discussion

Final Grade: Reporter

4

do not bend

	E	4
Scoring Guideling	nes  Juror: Kalhan Teals	Room: Stage: 4 Problem no.: 16
application of appropriate mathematics • r	easonable experimental technique to gather experimental findings to draw suitable con-	• an explanation of the observed phenomena • an rand record data (or demonstrate the phenomena if clusions • an attempt to communicate difficult or
An opposition should show that: • the opponent challenged the reporter's unappropriate mathematics presented • the opponent appreciated and highlighted the st	nderstanding of the presented concepts, the opponent critiqued the experimental technique	ories and principles • the opponent understood the used and questioned the validity of the data • the
important aspects (especially the controver.	sial ones) • the reviewer's personal opinion von-trivial and demonstrated, where possible,	orter and opponent • the reviewer appreciated the was in evidence (not just superficial observations) • the reviewer's understanding of concepts, theories,
<ul> <li>The reporter, opponent and reviewer</li> <li>Consider the following suggestions to</li> <li>Select each partial grade from each se</li> </ul>	consists of a partial grade for physics, preeach start with 5 points.  add to or deduct from the initial 5 points ction and write it in the corresponding be no questions were posed or not finding showing the property of the property of the property of the physics and relevant physics of the property of the physics of th	ox.
Presentation ±1  Clear and understandable  Appropriate manner  Overall impression  Pour colours on griphs  Reporter ±1	Presentation ±1  Clear and understandable  Appropriate manner  Overall impression  And to be flexible and alla  Opponent ±1 Mortor to to the colors year.	THE STATE OF THE S
☐ Quality of experimental technique(s) ☐ Structure	Response to the reporter's solution  Shows the strong and weak poi of the report	Provides a thorough review of report and discussion  Expresses own opinion about topics presented or discussed
<ul> <li>☑ Explanation of formulae and symbols</li> <li>☑ Appropriate models, conformity of dimensions</li> <li>☑ Slides, on-site experiments, audio,</li> </ul>	<ul> <li>✓ Finds shortcomings or errors in the report</li> <li>✓ Relevance of the questions</li> <li>✓ Contribution to the discussion</li> </ul>	U 65=12
video, as appropriate	De la la contraction de la conscionation de la	the state of the s

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

☐ Novelty of the report

References, proper citations of ideas and input of others

☐ Contribution to the discussion

10

Final Grade: Opponent

Final Grade: Reviewer Property Property

Fight (Round no.): Room:	Stage:	Problem no.:
Juror: Lobysher	Signature:	13 le kurl

## A report should include:

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

### An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.

<ul> <li>Select each partial grade from each sed</li> </ul>	tion and write it in the corresponding box.	
<ul> <li>Don't punish missing 'answers' when n</li> </ul>	o questions were posed or not finding shortco	omings if there were none to find.
Rep.: 5	Opp.:5	Rev.: 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
	1	
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	☐ Expresses own opinion about
Explanation of formulae and symbols	of the report  Finds shortcomings or errors in	topics presented or discussed  Relevance of questions to both the
☐ Appropriate models, conformity	the report	reporter and the opponent
of dimensions	☐ Relevance of the questions	☐ Draws attention to points missed
☐ Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the
☐ Novelty of the report		fight assistant, so we can archive your partial grades – please
☐ Contribution to the discussion		do not bend
	· ·	the state of principles of an entire particles of a state of the state

Juror: M KUNESCH Signature: Problem no.: 16

## A report should include:

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

#### An opposition should show that:

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

#### A review should show that:

Final Grade: Reporter

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

- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions to add to or deduct from the initial 5 points.
- Select each partial grade from each section and write it in 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	Opp.: Singapore 5	Rev.: 6hina 5
Physics ±3	Physics ±3 +1.5	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 + e.s	☐ Clear and understandable • 1	Clear and understandable
☐ Appropriate manner - 0.5	☐ Appropriate manner - 1.0	☐ Appropriate manner
Overall impression	Overall impression	Overall impression
Reporter ±1 + o.s	Opponent ±1 +0.5	Reviewer ±1
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	Provides a thorough review of report and discussion
☐ Structure	☐ Shows the strong and weak points	☐ Expresses own opinion about
Explanation of formulae and	of the report	topics presented or discussed
symbols	☐ Finds shortcomings or errors in the report	<ul> <li>Relevance of questions to both the reporter and the opponent</li> </ul>
Appropriate models, conformity of dimensions	Relevance of the questions	M 5
Carrier on the second	_ notestance 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		This sheet will be collected by the
☐ Novelty of the report		fight assistant, so we easier archive your partial grades — please
☐ Contribution to the discussion	-	Ja not bend
		OD The comments of the second

	- 11 11	Light
Scoring	Guidelines	
Jeoning	Galacillo	luror

Fight (Round no.): F Room: Att Stage: 4 Problem no.: 16

Juror: S. By Caud Signature: J Problem no.: 16

## A report should include:

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

## An opposition should show that:

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

## A review should show that:

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

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

	o questions were posed or not finding shortco	omings if there were none to find.
Rep.: Slovaling 5	Opp.: Sinjapar 5	Rev.: Claria 5
Physics ±3 +2	Physics ±3 + 1/2	Physics ±3 +½
☐ 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	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers
Presentation ±1 + /2   ☑ Clear and understandable	Presentation ±1	Presentation ±1
Appropriate manner	Clear and understandable  Appropriate manner	☐ Clear and understandable ☐ Appropriate manner
Overall impression	☐ Overall impression	☐ Appropriate manner☐ Overall impression
Reporter ±1	Opponent ±1	Reviewer ±1 +/h
<ul> <li>Quality of experimental technique(s)</li> </ul>	Response to the reporter's solution	Provides a thorough review of report and discussion
☑ Structure	☐ Shows the strong and weak points	☑ Expresses own opinion about
<ul><li>Explanation of formulae and symbols</li></ul>	of the report  Finds shortcomings or errors in the report	topics presented or discussed  Relevance of questions to both the reporter and the opponent
Appropriate models, conformity of dimensions	Relevance of the questions	Draws attention to points missed
Slides, on-site experiments, audio, video, as appropriate	☐ Contribution to the discussion	by the reporter or the opponent
References, proper citations of ideas and input of others		This sheet will be collected by the fight assistant, so we can scan it and fight assistant, and grades – please
		archive your partial studen
① Contribution to the discussion		do not bend
Final Grade: Reporter	Final Grade: Opponent Revised a	Final Grade: Reviewer  fter IOC feedback and approved by EC on 2011-11-03

Fight (Round no.):	Room:	Stage:	Problem no.:	_
h.com.	61			

## A report should include:

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

## An opposition should show that:

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

#### A review should show that:

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

The grade for each of the three teams consists of a partial grade for physics, presentation and for their smalling all

<ul> <li>The reporter, opponent and reviewer e</li> <li>Consider the following suggestions to a</li> <li>Select each partial grade from each sec</li> </ul>	add to or deduct from the initial 5 points. tion and write it in the corresponding box.	
• Don't punish missing 'answers' when no Rep.:	Opp.: 5	Rev.: 5
Physics ±3 2 X	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  Presentation +1	☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers
Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  Reporter ±1	Presentation ±1  Clear and understandable  Appropriate manner  Overall impression  Opponent ±1	Presentation ±1  Clear and understandable  Appropriate manner  Overall impression  Reviewer ±1
Quality of experimental technique(s)	Response to the reporter's solution	Provides a thorough review of report and discussion
<ul> <li>□ Structure</li> <li>□ Explanation of formulae and symbols</li> <li>□ Appropriate models, conformity of dimensions</li> </ul>	□ Shows the strong and weak points of the report □ Finds shortcomings or errors in the report	Expresses own opinion about topics presented or discussed  Relevance of questions to both the reporter and the opponent
Slides, on-site experiments, audio, video, as appropriate	☐ Relevance of the questions ☐ Contribution to the discussion	Draws attention to points missed by the reporter or the opponent
<ul> <li>□ References, proper citations of ideas and input of others</li> <li>□ Novelty of the report</li> </ul>		This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please
Contribution to the discussion		do not bend

Final Grade: Reporter Final Grade: Opponent Final Grade: Reviewer Final Grade: Reviewer

Round: Final Room: Fight Assistants: Georg Hofferch, Timoffeng Hell

		Stage 1	-		Stage 2		I	Stage 3			Stage 4	
Own		China	Poland	China	Poland	Slovatia	Poland	Scoraking	Singa pore	Slovakia	Singapore	China
Juror	Rep	Орр	Rev	Rep	Орр	Rev	Rep	Орр	Rev	Rep	Орр	Rev
Valentin Lobyshev	7	8	10	8	8	8	8	7	9	9	7	7
Markus Kunesch	6	7	6	5	8	7	5	8	9	7	7	6
Samuel Byland	9	7	6	5	8	6	7	7	8	9	7	6
Kreso Zadro	8	8	7	7	6	7	7	7	8	9	8	7
Kathern Zealand	8	7	7	8	9	7	6	7	7	10	7	5
Prapun Manyum	8	9	8	7	8	7	7	7	9	8	9	6
Kim Freimann	9	9	7	6	6	6	4	4	7	8	7	7
Florian Ostermaien	7	8	7	6	7	7	7	6	9	6	8	7
Gavin Jennings	7	7	7	.6	7	6	7	7	9	8	8	5
Thomas Lindner	8	8	6	5	6	6	5	7	8	9	6	5
llya Martchenko	7	8	8	6	10	7	6	9	10	9	6	6
Acting Team Member	Soe Tan	Zao Yixi4	Anna Wald	Lin Ruihao	Radost Was diewie	Vaheliu Ruzithova	Typus Muse Mistig	Jakub chushk	Lt Bingjan	Maker Badin	Phylles Poh	Sicoy La
Accepted Problem	1. Inve	ent Your	self	5. Loa	ided Hoo	Ø	2. Hole	gram		16. Mag	gnetic bro	