| ~   | •     | -   |      | H 0   |
|-----|-------|-----|------|-------|
| CO  | MINN  |     | 100  | INAC  |
| コレロ | IIIIU | UU. | IUEI | lines |
|     |       |     |      |       |

Physics ±3

☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression

☐ Appropriate models, conformity

References, proper citations of ideas and input of others

☐ Contribution to the discussion

☐ Scientific approach

☐ Accurate answers

Presentation ±1

Reporter ±1

☐ Structure

| c · c · ı ı   | Fight (Round no.): Final Room   | n: Stage: Problem no.:   |  |  |  |
|---|---|--|--|--|--|
| Scoring Guidelii  | 1es Juror: Royan Manyum   | Signature: ————————————————————————————————————  |  |  |  |
| application of appropriate mathematics • re   | ts, theories and principles of the problem • an e<br>easonable experimental technique to gather and r<br>xperimental findings to draw suitable conclusio<br>dable manner                    | ecord data (or demonstrate the phenomena if  |  |  |  |
| An opposition should show that: • the opponent <i>challenged</i> the <i>reporter's un appropriate mathematics</i> presented • the opponent appreciated and highlighted the <i>st</i>  | nderstanding of the presented concepts, theories a<br>oponent critiqued the experimental technique use<br>rengths and weaknesses of the report  | and <i>principles</i> • the opponent understood the d and questioned the <i>validity</i> of the <i>data</i> • the  |  |  |  |
| important aspects (especially the controvers such personal opinions were informative, no principles and appropriate mathematics used.  The grade for each of the three teams. The reporter, opponent and reviewer of Consider the following suggestions to a suggestions. | consists of a partial grade for <i>physics, present</i>   | evidence (not just superficial observations) • eviewer's understanding of concepts, theories,  |  |  |  |
| ep.: Konca  5  Opp.: Singa pore  5  Rev.: Iran  5   |   |  |  |  |  |
| Chysics ±3  Correct and relevant physics  Scientific approach Validity of conclusions Accurate answers  | Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers   | Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers  |  |  |  |
| resentation ±1  Clear and understandable  Appropriate manner  Overall impression  eporter ±1  | Presentation ±1  Clear and understandable P. My Appropriate manner Overall impression  Opponent ±1  | Presentation ±1  Clear and understandable  Appropriate manner  Overall impression  Reviewer ±1   |  |  |  |
| Quality of experimental technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio, video, as appropriate   | Response to the reporter's solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions  Contribution to the discussion | Provides a thorough review of report and discussion  Expresses own opinion about topics presented or discussed  Relevance of questions to both the reporter and the opponent  Draws attention to points missed by the reporter or the opponent |  |  |  |
| References, proper citations of ideas and input of others  Novelty of the report  |   | This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please  |  |  |  |

Final Grade: Reporter

☐ Novelty of the report

Final Grade: Opponent



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

do not bend



# Scoring

| Sooring Cuidali   |  | n: Stage: Problem no.:   |
|---|--|--|
| Scoring Guidelii  | 1es Juror: T.BALCOMBE  | Signature: Hh Bu   |
| application of appropriate mathematics • re   | ts, theories and principles of the problem • an e<br>easonable experimental technique to gather and a<br>experimental findings to draw suitable conclusion   | record data (or demonstrate the phenomena if   |
| An opposition should show that: • the opponent challenged the reporter's us   | nderstanding of the presented concepts, theories pponent critiqued the experimental technique use  | and <i>principles</i> • the opponent understood the d 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 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</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> .  add to or <i>deduct</i> from the initial <i>5 points</i> .  ction and <i>write it</i> in the corresponding box.  to questions were posed or not finding shortcomes. |  |
| Rep.: Krnea 5   | Opp.: Sigapore 5   | Rev.:_ / 5   |
| Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers   | Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers  | Physics ±3  ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers                  |
| Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression   | Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  | Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  |
| Reporter ±1  Quality of experimental technique(s)   | Opponent ±1  Response to the reporter's solution   | Reviewer ±1  Provides a thorough review of report and discussion   |
| ☐ Structure ☐ Explanation of formulae and symbols   | Shows the strong and weak points of the report   | Expresses own opinion about topics presented or discussed  |
| <ul> <li>□ Appropriate models, conformity of dimensions</li> <li>□ Slides, on-site experiments, audio,</li> </ul>                                       | the report  Relevance of the questions   | Relevance of questions to both the reporter and the opponent  Draws attention to points missed by the reporter or the opponent |
| video, as appropriate  References, proper citations of ideas and input of others  | ☐ Contribution to the discussion   | This sheet will be collected by the  |
| <ul><li>☐ Novelty of the report</li><li>☐ Contribution to the discussion</li></ul>  |  | fight assistant, so we can<br>archive your partial grades – please<br>do not bend  |

Final Grade: Reporter

Final Grade: Opponent

## Scoring Guidelines

Fight (Round no.): \_\_\_\_\_ Room: Stage: Problem no. Juror: TVANANTSIPAU 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.

| <ul> <li>Select each partial grade from each sec</li> <li>Don't punish missing 'answers' when no</li> </ul> | tion and <i>write it</i> in the corresponding box.<br>o questions were posed or not finding shortco | omings if there were none to find.                  |
|---|---|---|
| Rep.: <u>KO R E A</u> 5   | Opp.: <u>SI N 64 POR F</u> 5  | <b>Rev.:</b> IRAN 5                                 |
| Physics ±3  | Physics ±3  | Physics ±3  |
| Correct and relevant physics  | Correct and relevant physics  | 由 Correct and relevant physics                      |
| 🛱 Scientific approach   | Scientific approach   | Scientific approach                                 |
| <b>¼</b> Validity of conclusions  | ☑ Validity of conclusions   | ► Validity of conclusions                           |
| 🗐 Accurate answers  | ☐ Accurate answers  | ☐ Accurate answers                                  |
| Presentation $\pm 1$  | 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  | ######################################              |

Finds shortcomings or errors in

Relevance of the questions

Contribution to the discussion

Explanation of formulae and symbols

Appropriate models, 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



Final Grade: Reviewer

do not bend

topics presented or discussed

Relevance of questions to both the reporter and the opponent

Draws attention to points missed by the reporter or the opponent

This sheet will be collected by the

fight assistant, so we can scan it and

archive your partial grades - please



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

|  | 9  |   |                                |  |
|--|--|---|--------------------------------|--|
| Scoring Guidelin   |  | oom: Stage: Problem   | 1 no.:                         |  |
| A report should include:  • a presentation of the appropriate concepts application of appropriate mathematics • real appropriate) • linking of theoretical and expropriate ideas in an effective and understanded. | sonable <b>experimental technique</b> to <i>gather</i> a<br>perimental findings to draw suitable concl                               | nd <i>record data</i> (or <i>demonstrate</i> the <i>phen</i>                      | nomena if                      |  |
| An opposition should show that: • the opponent challenged the reporter's una appropriate mathematics presented • the oppoponent appreciated and highlighted the street   | onent critiqued the experimental technique   | ies and principles • the opponent undersused and questioned the validity of the d | stood the                      |  |
| A review should show that: • the reviewer succeeded in giving an objecti important aspects (especially the controversion such personal opinions were informative, non principles and appropriate mathematics used  | <ul> <li>ones) • the reviewer's personal opinion was<br/>trivial and demonstrated, where possible, th</li> </ul>                     | as in evidence ( <b>not</b> just <b>superficial observ</b>                        | rations) •                     |  |
| The grade for each of the three teams of the reporter, opponent and reviewer each consider the following suggestions to a Select each partial grade from each sect Don't punish missing 'answers' when no          | ich <i>start with 5 points</i> .<br>Idd to or deduct from the initial <i>5 points</i> .<br>Ion and write it in the corresponding box |   |                                |  |
| Sep.:  | Opp.:5   | Rev.:   | 5                              |  |
| hysics ±3 +2   | Physics ±3   | Physics ±3  | 2                              |  |
| Correct and relevant physics   | Correct and relevant physics   |   | ☐ Correct and relevant physics |  |
| Scientific approach  | Scientific approach  | ☐ Scientific approach   |                                |  |
| Yalidity of conclusions  | ☐ Validity of conclusions  | ☐ Validity of conclusions   |                                |  |

| <b>Rep.:</b> 5   | Opp.:5   | Rev.:5   |
|--|--|--|
| Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers  Presentation ±1  Clear and understandable Appropriate manner Overall impression                     | Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers  Presentation ±1  Clear and understandable Appropriate manner Overall impression                             | Physics ±3  Correct and relevant physics  Scientific approach  Validity of conclusions  Accurate answers  Presentation ±1  Clear and understandable  Appropriate manner  Overall impression  |
| Reporter ±1  Quality of experimental technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio, video, as appropriate | Opponent ±1  ☐ Response to the reporter's solution  ☐ Shows the strong and weak points of the report  ☐ Finds shortcomings or errors in the report  ☐ Relevance of the questions  ☐ Contribution to the discussion | Reviewer ±1  ☐ Provides a thorough review of report and discussion ☐ Expresses own opinion about topics presented or discussed ☐ Relevance of questions to both the reporter and the opponent ☐ Draws attention to points missed by the reporter or the opponent |
| <ul> <li>□ References, proper citations of ideas and input of others</li> <li>□ Novelty of the report</li> <li>□ Contribution to the discussion</li> </ul>   |  | This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend  |

Final Grade: Reporter

Final Grade: Opponent



| S | CO | rin | g | Gu | ıid | el | in | es |
|---|----|-----|---|----|-----|----|----|----|
|   |    |     |   |    |     |    |    |    |

☐ Correct and relevant physics

☐ Scientific approach

☐ Accurate answers

Presentation ±1

☐ Validity of conclusions

Clear and understandable

☐ Appropriate manner

Quality of experimental

☐ Appropriate models, conformity

Contribution to the discussion

☐ Overall impression

Reporter ±1

☐ Structure

Physics ±3

|   | Fight (Round no.): Roor  | n: Stage: Problem no.:  |
|---|--|---|
| Scoring Guidelii  | nes Juror: Lobyster  |   |
| application of appropriate mathematics • r  | ets, theories and principles of the problem • an eleasonable 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 un  | nderstanding of the presented concepts, theories pponent critiqued the experimental technique use  | and <i>principles</i> • the opponent understood the d and questioned the <i>validity</i> of the <i>data</i> • the |
| 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 red by the reporter and the opponent   | n evidence (not just superficial observations) •  |
| The <b>reporter</b> , <b>opponent</b> and <b>reviewer</b> Consider the following <b>suggestions</b> to Select each partial grade from each se | consists of a partial grade for <i>physics</i> , <i>presen</i> each <i>start with 5 points</i> .  add 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 shortc |   |
| tep.:   Loreq 5   | Opp.: Singapor 5   | Rev.: Iran. 5   |
| 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  | 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  | 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 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 the fight assistant, so we can scan it and  |
| Novelty of the report   |  | fight assistant, so we can see<br>archive your partial grades — please  |
| Contribution to the discussion  |  | do not bend   |
| 7   |  |   |
| - I   | 1 X I I  | 1 / 3   |

Final Grade: Reporter

☐ Novelty of the report



Final Grade: Opponent





| Cooming of Cariolalia | Fight (Round no.):                    | Room: Stage: _ | Problem no.: _ |
|-----------------------|---------------------------------------|----------------|----------------|
| Scoring Guidelines    | Juror: <u>Byland</u>                  | Signature:     | 200            |
|                       | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ |                | 7              |

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three 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>Consider the following <i>suggestions</i> to a</li> <li>Select each partial grade from each sec</li> </ul> | add to or deduct from the initial 5 points.<br>tion and write it in the corresponding box.<br>o questions were posed or not finding shortco | omings if there were none to find.   |
|---|---|--|
| Rep.: Kovea 5   | Opp.: Singapore 5   | <b>Rev.:</b> 1 ran 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   |
| 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                        |
|   | 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 wining weeks  | 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 dead archive your partial grades — please           |
| ☐ Contribution to the discussion  |   | do not bend  |
|   |   |  |

Final Grade: Reporter

9

Final Grade: Opponent

|  | Scor | ing | Guid | lelines |
|--|------|-----|------|---------|
|--|------|-----|------|---------|

| Fight (Round no.): | Room:    | Stage:   | _ Problem no.: _ | 1 |
|--------------------|----------|----------|------------------|---|
| Juror: k. ZADRO    | Signatur | e. tree, | too              |   |

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for *physics*, *presentation* and for their *specific role*.
- 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.<br>o questions were posed or not finding shortco | omings if there were none to find.   |
|---|--|--|
| Rep.: 5   | Opp.: 514 (A P) 25 5   | Rev.: 1842 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  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           |
| 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 design archive your partial grades — please         |
| ☐ Contribution to the discussion                          |  | do not bend  |
| [   |  |  |



Final Grade: Opponent



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



| Sco | ring | <b>Guidelines</b> |
|-----|------|-------------------|
|     |      |                   |

| Fight (Round no.): _ | FRoom:        | Stage:/          | Problem no.:/ |
|----------------------|---------------|------------------|---------------|
| Juror: Kathryn       | Realand Signa | ture: <u>H</u> Z | my.           |

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the

| such personal opinions were informative, no principles and appropriate mathematics used  | ital ones) • the reviewer's personal opinion was in<br>n-trivial and demonstrated, where possible, the red<br>d by the reporter and the opponent  | evidence (not just superficial observations) • eviewer's understanding of concepts, theories, |
|--|---|---|
| <ul> <li>The reporter, opponent and reviewer of the consider the following suggestions to one of the second 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> .  ation and <i>write it</i> in the corresponding box.  o questions were posed or not finding shortco |   |
| Rep.: KOREA  not enough variables 5  Mus hyatal.  Physics ±3  ***  **Table 1.**  **Table 2.**  **Table 2.**  **Table 3.**  **Tab       | Opp.: SINGAPORE 5  aould have theel 5  to see more Physics ±3 ergagmy +2  | Rev.: 1RAN 5  Physics ±3  |
| Correct and relevant physics   | Correct and relevant physics  | Correct and relevant physics  |
| Scientific approach not have   | — yearning approach   | Scientific approach   |
| Validity of conclusions CY XV  | 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 Spe to 100   | Appropriate manner  |
| Overall impression   | Overall impression fast   | 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 too fast to write  | 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   | (Contribution to the discussion   | by the reporter or the opponent   |
| video, as appropriate  | and a estion about retertion  | Good Questions  |
| References, proper citations of  | good grestion about retenting<br>force after detach   | be collected by the   |
|  | To the solution   | + FO WE Call Seatt  |
| Novelty of the report  |   | archive your partial grades   |
| ☐ Contribution to the discussion   |   | do not bend   |
| 794  | 9   | CI  |

Final Grade: Reporter



Final Grade: Opponent



| Searing Cuidali  | Fight (Round no.): F Roo  | m: SF Stage: 1 Problem no.; 1  |
|--|---|--|
| Scoring Guideli  | nes Juror: PLESCH   | Signature:   |
| A report should include:   |   |  |
| • a presentation of the appropriate conce<br>application of appropriate mathematics •  | epts, theories and principles of the problem • an reasonable experimental technique to gather and experimental findings to draw suitable conclusion and able manner   | record data (or demonstrate the phenomena if   |
| An opposition should show that • the opponent challenged the reporter's appropriate mathematics presented • the opponent appreciated and highlighted the statement of the statem | understanding of the presented concepts, theories<br>opponent critiqued the experimental technique us   | 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 controve   | ective summary of the performances the reporter rsial ones) • the reviewer's personal opinion was non-trivial and demonstrated, where possible, the ed by the reporter and the opponent   | in 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 se</li> </ul>   | s consists of a partial grade for <i>physics, preser</i> reach <i>start with 5 points</i> .  To <i>add</i> to or <i>deduct</i> from the initial <i>5 points</i> .  The ection and <i>write it</i> in the corresponding box.  The no questions were posed or not finding shorters. |  |
| Rep.: 5  | <b>Opp.:</b> 5  | <b>Rev.:</b> 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  |
| <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 symbols  | 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  |
| Slides, on-site experiments, audio, video, as appropriate  |   | 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 see<br>archive your partial grades – please   |
| Contribution to the discussion   |   | do not bend  |
|  |   |  |

Final Grade: Reporter



Final Grade: Opponent



| Si | CO | rii | na  | G | ui | d        | el | in | es |
|----|----|-----|-----|---|----|----------|----|----|----|
| _  |    |     | - 3 | _ |    | <b>—</b> |    |    |    |

Fight (Round no.): 6 Room: 227 Stage:

#### A report should include:

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

#### An opposition should show that:

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

#### A review should show that:

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

| <ul> <li>Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.</li> </ul> |  |  |  |  |  |
|---|--|--|--|--|--|
| Rep.: Grea 5  | Opp.: Singapore 5                          | Rev.: 100n 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  |  |  |  |
| <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   |  |  |  |
| <ul> <li>Appropriate models, conformity of dimensions</li> </ul>  |  | reporter and the opponent  |  |  |  |
| _   | Relevance of the questions                 | Draws attention to points missed by the reporter or the opponent           |  |  |  |
| Slides, on-site experiments, audio, video, as appropriate   | ☐ Contribution to the discussion           |  |  |  |  |
| References, proper citations of ideas and input of others   |  | 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



| S | CO | ri | ng  | Gu | ıid | el | in | es |
|---|----|----|-----|----|-----|----|----|----|
| _ |    |    | - 5 |    |     |    |    |    |

| Fight (Round no.): Stage:                                 | 1 | _ Problem no.: _ | 最   |
|---|---|------------------|-----|
| Juror: Ilya MARTCHENNO Signature:                         | / | Ur_              |     |
| and principles of the problem • an explanation of the ob. |   | •                | - 1 |

• a presentation of the appropriate concepts, theories application of appropriate mathematics • reasonable ex appropriate) • linking of theoretical and experimental findings to draw suitable conclusions • an attempt to communicate difficult or complex ideas in an effective and understandable manner

#### An opposition should show that:

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

#### A review should show that:

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

| <ul> <li>Select each partial grade from each sec</li> </ul> | each start with 5 points.<br>add to or deduct from the initial 5 points.<br>tion and write it in the corresponding box.<br>to questions were posed or not finding shortco | omings if there were none to find.   |
|---|---|--|
| Rep.: Korea 5   | Opp.: Singapore 5   | Rev.: \Ran 5   |
| Physics ±3 +2   | 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  |
| <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                                     |   | fight assistant, so we com-<br>archive your partial grades – please        |
| ☐ Contribution to the discussion                            |   | do not bend  |
| 8   | 8   | 0  |

Final Grade: Reporter

Final Grade: Opponent





|  | Scoring | g Gui | idel | ines |
|--|---------|-------|------|------|
|--|---------|-------|------|------|

| Fight (Round no.): Find Room | : Stage: 2 Problem no.: |
|------------------------------|-------------------------|
| Juror: Popen Mayum           | Signature: H. Mayerm    |

| Α | re. | port | shoul | d in | clude: |
|---|-----|------|-------|------|--------|
|---|-----|------|-------|------|--------|

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

#### An opposition should show that:

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

#### A review should show that:

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

| <ul> <li>Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.</li> </ul>   |  |   |  |
|---|--|---|--|
| Rep.: Singapore 5   | Opp.:  | Rev.: Korea 5   |  |
| Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers   | Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers  | Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers   |  |
| Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression   | Presentation ±1  | Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression   |  |
| Reporter ±1   | Opponent ±1  | Overall impression  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>□ Structure</li> <li>□ Explanation of formulae and symbols</li> <li>□ Appropriate models, conformity of dimensions</li> <li>□ Slides, on-site experiments, audio,</li> </ul> | <ul> <li>□ Shows the strong and weak points of the report</li> <li>□ Finds shortcomings or errors in the report</li> <li>□ Relevance of the questions</li> <li>□ Contribution to the discussion</li> </ul> | <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 by the reporter or the opponent</li> </ul> |  |
| video, as appropriate  References, proper citations of ideas and input of others  Novelty of the report  Contribution to the discussion   |  | This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades — please do not bend   |  |

Final Grade: Reporter

Final Grade: Opponent

| Sco | ring | Guidelines |
|-----|------|------------|
|     |      |            |

| Scoring Guidelin  | Fight (Round no.): ANAL Room  Juror: J.BALCOMBR  | n: Stage: B Problem no.: _5   |
|---|--|---|
| application of appropriate mathematics • re   | ts, theories and principles of the problem • an experimental technique to gather and 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 state. | nderstanding of the presented concepts, theories oponent critiqued the experimental technique use rengths and weaknesses of the report   | and <i>principles</i> • the opponent understood the d and questioned the <i>validity</i> of the <i>data</i> • the |
| 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)  |
| The <i>reporter, opponent</i> and <i>reviewer</i> end Consider the following <i>suggestions</i> to a Select each partial grade from each sec                        | 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> .  Stion and <i>write it</i> in the corresponding box.  To questions were posed or not finding shorter |   |
| Rep.: Syrpne 5  thysics ±3  | Opp.:  | Rev.: <u>Kovea</u> 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  |
| resentation ±1  | Presentation ±1  | Presentation ±1   |
| Clear and understandable  | Clear and understandable   | ☐ Clear and understandable  |
| Appropriate manner  | ☐ Appropriate manner   | Appropriate manner  |

# ☐ Accurate answers

Physics ±3

Presentation ±1

Clear and understandable Appropriate manner

Scientific approach ☐ Validity of conclusions

Overall impression

### Reporter ±1

Quality of experimental technique(s)

Explanation of formulae and symbols

Appropriate models, conformity of dimensions

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

References, proper citations of ideas and input of others

Novelty of the report

☐ Contribution to the discussion

Final Grade: Reporter

|    | ,                                     |            |
|----|---------------------------------------|------------|
|    | Correct and relevant ph               | ysics      |
|    | Scientific approach                   |            |
|    | Validity of conclusions               |            |
|    | Accurate answers                      |            |
|    |                                       |            |
| Pr | esentation ±1                         | +1         |
|    | Clear and understandab                | le         |
|    | Appropriate manner                    |            |
|    | Overall impression                    |            |
|    |                                       |            |
| Ok | ponent ±1                             | +1         |
|    | Response to the reporte solution      | r's        |
|    | Shows the strong and we of the report | eak points |
|    | Finds shortcomings or er the report   | rors in    |
|    | Relevance of the questio              | ns         |
|    | Contribution to the discu             | ssion      |
|    |                                       |            |
|    |                                       |            |
|    |                                       |            |

Final Grade: Opponent

|   | Physics ±3                | +2   |
|---|---------------------------|------|
|   | Correct and relevant phys | sics |
|   | ☐ Scientific approach     |      |
|   | ☐ Validity of conclusions |      |
|   | ☐ Accurate answers        |      |
|   | Presentation ±1           | +1   |
|   | Clear and understandable  | 2    |
|   | ☐ Appropriate manner      |      |
| 1 | Overall impression        |      |

### Reviewer ±1

Provides a thorough review of report and discussion

Expresses own opinion about topics presented or discussed

Relevance of questions to both the reporter and the opponent

 Draws attention to points missed by the reporter or the opponent

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

do not bend

Final Grade: Reviewer



|  | Fight (Round no.): Roon   | n: Stage: Problem no.: <u>3</u>  |
|--|---|--|
| Scoring Guidel   | inac  | Signature:   |
| <del>.</del>   | Julion. DV/IIV /IV ISJYA  | Signature: Jefgrung  |
| A report should include:   |   |  |
| application of appropriate mathematics   | cepts, theories and principles of the problem • an<br>• reasonable experimental technique to gather and<br>dexperimental findings to draw suitable conclusion<br>candable manner  | record data (or demonstrate the phenomena if   |
| An opposition should show that • the opponent challenged the reporter's appropriate mathematics presented • the opponent appreciated and highlighted the | s understanding of the presented concepts, theories<br>e opponent 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 control  | pjective summary of the performances the reporter versial ones) • the reviewer's personal opinion was in non-trivial and demonstrated, where possible, the rused by the reporter and the opponent   | n evidence (not just superficial observations) •   |
| <ul> <li>The reporter, opponent and review</li> <li>Consider the following suggestions</li> <li>Select each partial grade from each</li> </ul>           | ns consists of a partial grade for <i>physics</i> , <i>presener</i> each <i>start with 5 points</i> .  to <i>add</i> to or <i>deduct</i> from the initial <i>5 points</i> .  section and <i>write it</i> in the corresponding box. In no questions were posed or not finding shorto |  |
| Rep.: SINGAPORE 5  | Opp.: $\overline{LRAN}$ 5   | Rev.: <u>  KOREA</u>   |
| Physics ±3   | Physics ±3  | Physics ±3   |
| Correct and relevant physics   | Correct and relevant physics  | Correct and relevant physics   |
|  | Scientific approach   | D 生 Scientific approach  |
| Accurate answers   | ☐ Validity of conclusions ☐ Accurate answers  | ₩ Validity of conclusions  Accurate answers  |
|  |   |  |
| Presentation ±1  | Presentation ±1   | Presentation ±1 + 1  |
| Clear and understandable  Appropriate manner   | Clear and understandable  | Clear and understandable   |
| ☐ Appropriate manner    Overall impression   | Appropriate manner  Overall impression  | Appropriate manner   |
|  | Coverair Impression   | Overall impression   |
| Reporter ±1  | Opponent ±1   | Reviewer ±1 $t = 1$  |
| 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  |
| Explanation of formulae and symbols  | Finds shortcomings or errors in the report  | topics presented or discussed  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   |   | 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 con<br>archive your partial grades – please   |
| Contribution to the discussion   |   | do not bend  |

Final Grade: Opponent

Final Grade: Reporter

| Scol | ring | Gu | ide | lines |
|------|------|----|-----|-------|
|      |      |    |     |       |

| Scoring Guidelir  |  | Stage: Problem no.:   |
|---|--|---|
| application of appropriate mathematics • re   | ts, theories and principles of the problem • an e<br>easonable experimental technique to gather and in<br>experimental findings to draw suitable conclusion<br>elable manner   | ecord 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 street. | nderstanding of the presented concepts, theories a<br>oponent critiqued the experimental technique use<br>rengths and weaknesses of the report   | and <i>principles</i> • the opponent understood the d and questioned the <i>validity</i> of the <i>data</i> • the |
| such personal opinions were informative, no.  principles and appropriate mathematics used   |  | evidence (not just superficial observations) • eviewer's understanding of concepts, theories,                     |
| The <b>reporter</b> , <b>opponent</b> and <b>reviewer</b> of Consider the following <b>suggestions</b> to Consider the partial grade from each sections.            | 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> .  tion and <i>write it</i> in the corresponding box.  o questions were posed or not finding shortco |   |
| Rep.: Singapore 5  Physics ±3  12   | Opp.:  | Rev.: Kovea 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  |
| resentation ±1  | Presentation ±1  | Presentation ±1   |
| Clear and understandable  | ☐ Clear and understandable   | ☐ Clear and understandable  |
| Appropriate manner  | ☐ Appropriate manner   | ☐ Appropriate manner  |
| Overall impression  | Overall impression   | Overell improved in the   |

### Presentation ±1

Scientific approach ☐ Validity of conclusions Accurate answers

Physics ±3

Overall impression

### Reporter ±1

Quality of experimental technique(s)

Structure

☐ Explanation of formulae and symbols

Appropriate models, conformity of dimensions

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

References, proper citations of ideas and input of others

☐ Novelty of the report

☐ Contribution to the discussion

Final Grade: Reporter

| Pł             | nysics ±3   | +2                        |
|----------------|---|---------------------------|
| 1              | Correct and relevant phy  | sics                      |
| ~              | Scientific approach   |                           |
|                | Validity of conclusions   |                           |
|                | Accurate answers  |                           |
| Pr             | esentation ±1  Clear and understandable  Appropriate manner  Overall impression   | 0                         |
|                | 1   |                           |
| On             | nonent ±1   | 1100                      |
| Oh             | ponent ±1   | +1,0                      |
|                | Response to the reporter solution   |                           |
|                | Response to the reporter  | 's                        |
| <br> 2'<br> 2' | Response to the reporter solution  Shows the strong and wes   | 's<br>ak points           |
| <br> 2'<br> 2' | Response to the reporter solution  Shows the strong and we of the report  Finds shortcomings or err                                       | 's<br>ak points<br>ors in |
|                | Response to the reporter solution  Shows the strong and we of the report  Finds shortcomings or errithe report                            | 's<br>ak points<br>ors in |
|                | Response to the reporter solution  Shows the strong and we of the report  Finds shortcomings or err the report  Relevance of the question | 's<br>ak points<br>ors in |
|                | Response to the reporter solution  Shows the strong and we of the report  Finds shortcomings or err the report  Relevance of the question | 's<br>ak points<br>ors in |
|                | Response to the reporter solution  Shows the strong and we of the report  Finds shortcomings or err the report  Relevance of the question | 's<br>ak points<br>ors in |

Overall impression

### Reviewer ±1

Provides a thorough review of report and discussion

Expresses own opinion about topics presented or discussed

Relevance of questions to both the reporter and the opponent

 Draws attention to points missed by the reporter or the opponent

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

do not bend

Final Grade: Opponent Final Grade: Reviewer



## Scoring Guidelin

☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers

Presentation ±1

Reporter ±1

☐ Structure

☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression

☐ Appropriate models, conformity

References, proper citations of ideas and input of others

☐ Contribution to the discussion

Rep.:

Physics ±3

|  | Fight (Round no.): Room  | n: Stage: Problem no.:  |
|--|--|---|
| Scoring Guidelin   |  | Signature: Rec  |
| application of appropriate mathematics • re  | ts, theories and principles of the problem • an e<br>easonable experimental technique to gather and r<br>experimental findings to draw suitable conclusion<br>dable manner   | ecord data (or demonstrate the phenomena if   |
| An opposition should show that:  • the opponent challenged the reporter's un   | nderstanding of the presented concepts, theories apponent critiqued the experimental technique use   | and <i>principles</i> • the opponent understood the d and questioned the <i>validity</i> of the <i>data</i> • the |
| A review should show that:   |  |   |
| important aspects (especially the controvers   | tive summary of the performances the reporter a<br>ial ones) • the reviewer's personal opinion was in<br>n-trivial and demonstrated, where possible, the red<br>by the reporter and the opponent   | evidence (not just superficial observations) •  |
| The <i>reporter, opponent</i> and <i>reviewer</i> of Consider the following <i>suggestions</i> to select each partial grade from each second | 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> .  Ition and <i>write it</i> in the corresponding box.  It o questions were posed or not finding shortco |   |
| Rep.:  | Opp.:5   | Rev.: 5   |
| 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   | Presentation ±1  | Presentation ±1   |
| Clear and understandable   | Clear and understandable   | Clear and understandable  |
| Appropriate manner Overall impression  | ☐ Appropriate manner   | ☐ Appropriate manner  |
| - Overall Impression   | Overall impression   | Overall impression  |
| eporter ±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   |
| Appropriate models, conformity of dimensions   |  | reporter and the opponent   |
| Slides, on-site experiments, audio, video, as appropriate  | <ul><li>☐ Relevance of the questions</li><li>☐ Contribution to the discussion</li></ul>  | ☐ 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<br>archive your partial grades – please  |
| Contribution to the discussion   |  | do not bend   |
|  |  |   |

Final Grade: Reporter

Novelty of the report



| Scoring Guidelines  | Fight (Round no.): F Room: Stage: 2 Problem no.: 5  |
|---|---|
| application of appropriate mathematics • reasonable   | es and principles of the problem • an explanation of the observed phenomena • an experimental technique to gather and record data (or demonstrate the phenomena if tal findings to draw suitable conclusions • an attempt to communicate difficult or other |
| An opposition should show that:  • the opponent challenged the reporter's understand, appropriate mathematics presented • the opponent opponent appreciated and highlighted the strengths are | ing of the presented concepts, theories and principles • the opponent understood the ritiqued the experimental technique used and questioned the validity of the data • the nd weaknesses of the report   |

#### A review should show that:

• the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* • the reviewer appreciated the *important aspects* (especially the *contraversial* opes) • the reviewer's personal opinion was in suidance (not instrumentally open).

| such personal opinions were informative, no principles and appropriate mathematics use   | idal ones) • the reviewer's personal opinion was in<br>in-trivial and demonstrated, where possible, the red<br>d by the reporter and the opponent  | evidence (not just superficial observations) • eviewer's understanding of concepts, theories, |  |
|--|--|---|--|
| <ul> <li>The reporter, opponent and reviewer of Consider the following suggestions to Select each partial grade from each sec</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> .  Ition and <i>write it</i> in the corresponding box.  It o questions were posed or not finding shortcom. |   |  |
| Rep.: Singapore 5  | Opp.: <u>(vau</u> 5  | Rev.: Karea 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  |  |
| <ul><li>Overall impression</li></ul>   | ☐ 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 symbols  | Explanation of formulae and  |   |  |
| Appropriate models, conformity of dimensions   | Appropriate models, conformity the report  |   |  |
| Slides, on-site experiments, audio, video, as appropriate  | E 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  |  | fight assistant, so we do a please archive your partial grades – please                       |  |
| ☐ Contribution to the discussion   |  | do not bend   |  |

Final Grade: Reporter

Final Grade: Opponent



| Sco | ring | Gu | id | eli | nes |
|-----|------|----|----|-----|-----|
|     |      |    |    |     |     |

| Fight (Round no.): | Room: Stage: 2 Problem no.: _ | 3 |
|--------------------|-------------------------------|---|
| Juror: K. ZADNO    | Signature: to to              |   |

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

| Α | re | port         | shoul | ld | inc  | lude: |
|---|----|--------------|-------|----|------|-------|
| _ |    | <b>701</b> L | 31104 | ·· | 1110 | uuc.  |

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* the reviewer appreciated the *important aspects* (especially the *controversial* ones) the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) such personal opinions were *informative*, *non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts*, *theories*, *principles* and *appropriate mathematics* used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for physics, presentation and for their specific role.
- 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><li>Don't punish missing 'answers' when n</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.:5  | Opp.:5  | <b>Rev.:</b> 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   | 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  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  |
|   |   |  |

| Scoring Guidelines |
|--------------------|
|--------------------|

| Fight (Round no.): | Room:     | Stage: 2 | Problem no.: | 5 |
|--------------------|-----------|----------|--------------|---|
| Juror: ZEXLAND     | Signature | : Ka     | edali        |   |

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

#### An opposition should show that:

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

#### A review should show that:

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

| <ul> <li>The reporter, opponent and reviewer</li> </ul>    |   | tation and for their specific role.   |
|--|---|---|
| <ul> <li>Consider the following suggestions to</li> </ul>  | add to or deduct from the initial 5 points.   |   |
| <ul> <li>Select each partial grade from each se</li> </ul> | ction and write it in the corresponding box.  |   |
| <ul> <li>Don't punish missing 'answers' when r</li> </ul>  | no questions were posed or not finding shortc | omings if there were none to find.  |
| Rep.: SINGAPORE 5  Only one emptrical experient            | Opp.: IRAN needed to fours 5                  | Rev.: KOREA 5   |
| only one emptrical experient                               | more on lack of TAX                           |   |
| Physics ±3   | Physics ±3 experiment +1 to                   | 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  | Presentation ±1                               | Presentation ±1   |
| Clear and understandable                                   | Clear and understandable                      | Clear and understandable  |
| Appropriate manner   | Appropriate manner to short                   | Appropriate manner ??   |
| Overall impression   | Overall impression                            | Overall impression  |
| Reporter ±1 + ½  | 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                                 | Expresses own opinion about 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   |
|  | needed to all about suclahin                  |   |
| 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 scan it and archive your partial grades - please |
|  | 5 <u>~</u> * 2000                             | archive your partial s  |
| Contribution to the discussion                             | * Cecll                                       | do not bend   |
| 6  | 87  | 9   |

Final Grade: Reporter

Final Grade: Opponent



| S | C | 01 | ri | n | g | G | u | id | e | li  | n | e. | S |
|---|---|----|----|---|---|---|---|----|---|-----|---|----|---|
|   | _ |    |    |   | 3 |   | • | •  |   | , . |   | •  |   |

| Fight (Round no.): | Room: Stage: 2 | Problem no.:   |
|--------------------|----------------|----------------|
| Juror: FCESCH      | Signature:     | $\sim$ $\circ$ |

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.

| <ul> <li>Select each partial grade from each se</li> </ul> | add to or deduct from the initial 5 points. ction and write it in the corresponding box. |  |
|--|--|--|
| Rep.:  | 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  |
| 2 Validity of conclusions                                  | ☐ Validity of conclusions  | ☐ Validity of conclusions  |
| 🗘 Accurate answers   | ☐ Accurate answers   | ☐ Accurate answers   |
| Presentation ±1  | Presentation ±1  | Presentation ±1  |
| E Clear and understandable                                 | ☐ Clear and understandable   | Clear and understandable   |
| 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   | 172  |
| Explanation of formulae and                                | of the report  | Expresses own opinion about 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 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  |
| Novelty of the report                                      |  | This sheet will be control 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  |

| Scori | ina i | Gui | idel | lines |
|-------|-------|-----|------|-------|
|       | 9     |     |      |       |

| Fight (Round no.): _ | 6  | _ Room: | 727      | Stage:           | 2  | Problem no.: | 5 |
|----------------------|----|---------|----------|------------------|----|--------------|---|
| Juror: Pthum         | MA | RTI     | Signatur | . <sub>e</sub> . | Ph | was flow     | 1 |

| Α | re | port | should | incl | ude: |
|---|----|------|--------|------|------|
|---|----|------|--------|------|------|

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for *physics*, *presentation* and for their *specific role*.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following *suggestions* 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 questions were posed or not finding shortcomings if there were none to find.</li> </ul> |  |  |  |  |  |  |
|---|--|--|--|--|--|--|
| Rep.: Slagapore 5   | Opp.: Iran 5   | Rev.: Konea 5  |  |  |  |  |
| Physics ±3  | Physics ±3   | Physics ±3   |  |  |  |  |
| <ul><li>☐ Correct and relevant physics</li><li>☐ Scientific approach</li></ul>  | ☐ Correct and relevant physics ☐ Scientific approach | Correct and relevant physics   |  |  |  |  |
| ☐ Validity of conclusions   |  | ☐ Scientific approach  |  |  |  |  |
| ☐ Accurate answers  | ☐ Validity of conclusions ☐ Accurate answers         | ☐ 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                  | 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 fight assistant, so we can scan it and   |  |  |  |  |
| ☐ Novelty of the report   |  | fight assistant, so we constant assistant, so we constant assistant, so we constant assistant assistant assistant assistant assistant, so we constant assistant assistant, so we constant assistant assistan |  |  |  |  |
| ☐ Contribution to the discussion  |  | do not bend  |  |  |  |  |
|   |  |  |  |  |  |  |

Final Grade: Reporter

Final Grade: Opponent

| Scori | ing ( | Gui | ide | lines |
|-------|-------|-----|-----|-------|
|       |       |     |     |       |

| Fight (Round no.): Fun Room: Stage: Problem no.: | 5 |
|--|---|
| Juror: 124 MARTCHENG Signature:                  |   |

| Α | re | port | 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:

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

| <ul> <li>Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.</li> </ul> |   |  |  |  |  |  |  |
|---|---|--|--|--|--|--|--|
| Rep.: Singapore 5   | Opp.: \Ran 5                                    | Rev.: Korea 5  |  |  |  |  |  |
| Physics ±3  Correct and relevant physics  | Physics ±3  ☐ Correct and relevant physics      | Physics ±3  Correct and relevant physics                                   |  |  |  |  |  |
| <ul><li>☐ Scientific approach</li><li>☐ Validity of conclusions</li></ul>   | ☐ Scientific approach ☐ Validity of conclusions | ☐ Scientific approach ☐ 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             | 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  |  |  |  |  |  |
| Appropriate models, conformity  | 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           |  |  |  |  |  |
| 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 fight assistant, so we can scan it and |  |  |  |  |  |
| ☐ Novelty of the report   |   | fight assistant, so we con-<br>archive your partial grades – please        |  |  |  |  |  |
| ☐ Contribution to the discussion  |   | do not bend  |  |  |  |  |  |
|   |   |  |  |  |  |  |  |

Final Grade: Reporter

0/

Final Grade: Opponent



| Scoring Guidelines   | Fight (Round no.): Juror:                        |                                   |                      | Problem no.: 11       |
|--|--|-----------------------------------|----------------------|-----------------------|
| A report should include:   |  |                                   |                      |                       |
| • a presentation of the appropriate concepts, theories application of appropriate mathematics • reasonable eappropriate) • linking of theoretical and experiments complex ideas in an effective and understandable manner. | experimental technique<br>al findings to draw su | e to <i>gather</i> and <i>red</i> | ord data (or demonst | rate the phenomena if |

### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for *physics*, *presentation* and for their *specific role*.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions 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 questions were posed or not finding shortcomings if there were none to find.</li> </ul> |  |  |  |  |  |  |
|---|--|--|--|--|--|--|
| Rep.: 5   | Opp.: Korea 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   | 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   | ☐ 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             | 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 con<br>archive your partial grades – please         |  |  |  |  |
| ☐ Contribution to the discussion  | 100  | do not bend  |  |  |  |  |

Final Grade: Reporter

| Scoring G | iuidelines |
|-----------|------------|
|-----------|------------|

| Fight (Round no.): FNR Boom: | Stage: <u>\$</u> Problem no. | : <u>//</u> |
|------------------------------|------------------------------|-------------|
| Juror: J.BACOMBE Signa       | ature: A.S.                  |             |

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

| Α | re | port | shou | ıld | 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:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three 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. etion and write it in the corresponding box. o questions were posed or not finding shortco | omings if there were none to find.   |
|---|--|--|
| Rep.:_ / 5  | Opp.: Konea 5  | Rev.: Sigapore 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 $\pm 1$   |
| <ul> <li>Clear and understandable</li> </ul>                | ☐ 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 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   |
| 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   | 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 glades  |
| ☐ Contribution to the discussion                            |  | do not bend  |
| Final Grade: Reporter                                       | Final Grade: Opponent  | Final Grade: Reviewer  |

| Scoring | Guidelines |
|---------|------------|
|---------|------------|

| Fight (Round no.): Indexem: Stage: Problem no.: | 1 |
|---|---|
| Juror: IVAN ANTST BU Signature:                 |   |
| All the second                                  |   |

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

#### An opposition should show that:

• the opponent challenged the reporter's understanding of the presented concepts, theories and principles • the opponent understood the appropriate mathematics presented • the opponent critiqued the experimental technique used 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 no questions were posed or not finding shortcomings if there were none to find.</li> </ul>  |  |  |  |  |
|--|--|--|--|--|
| Rep.: <u>IRAN</u> 5  | Opp.: <u>KORE A</u> 5  | Rev.: SINGA PORE 5   |  |  |
| Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers  | Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions Accurate answers  | Physics ±3  Correct and relevant physics  Scientific approach  Validity of conclusions  Accurate answers   |  |  |
| Presentation ±1  Clear and understandable  Appropriate manner  Overall impression  | Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  | Presentation ±1  ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  |  |  |
| Reporter ±1  Quality of experimental technique(s)  Structure  Explanation of formulae and symbols  Appropriate models, conformity of dimensions  Slides, on-site experiments, audio, video, as appropriate | Opponent ±1  Response to the reporter's solution  Shows the strong and weak points of the report  Finds shortcomings or errors in the report  Relevance of the questions  Contribution to the discussion | Provides a thorough review of report and discussion  Expresses own opinion about topics presented or discussed  Relevance of questions to both the reporter and the opponent  Draws attention to points missed by the reporter or the opponent |  |  |
| References, proper citations of ideas and input of others  Novelty of the report  Contribution to the discussion   |  | This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades – please do not bend  |  |  |

Final Grade: Opponent

|     | •    |    | • # |            |      |
|-----|------|----|-----|------------|------|
| SCO | rina |    | ud  | $\alpha u$ | nac  |
|     | ring | Uu | IIU |            | 1163 |
|     |      |    |     |            |      |

Rep.:

Physics ±3

Scientific approach

☐ Accurate answers

Presentation ±1

■ Validity of conclusions

☐ Clear and understandable

Appropriate models, conformity

☐ Appropriate manner

Overall impression

Reporter ±1

Structure

|  | c. 0   |   |
|--|--|---|
| Scoring Guideli  | right (Round no.): find Room  Juror: Chan You Li   | Signature: Problem no.:   |
|  | Julion. Milant J 21  | _ Signature.  |
| application of appropriate mathematics • 1   | ots, theories and principles of the problem • an ereasonable experimental technique to gather and resperimental findings to draw suitable conclusionable manner  | ecord data (or demonstrate the phenomena if   |
| An opposition should show that  • the opponent challenged the reporter's u appropriate mathematics presented • the co opponent appreciated and highlighted the s | nderstanding of the presented concepts, theories apponent critiqued the experimental technique use   | and <i>principles</i> • the opponent understood the d 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 resial ones) • the reviewer's personal opinion was in contrivial and demonstrated, where possible, the read 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   | 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 shortcomes. |   |
| Rep.: <u>1ran</u> 5  | Opp.: Korea 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  |
| resentation ±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  |
| eporter ±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   | 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   |

Contribution to the discussion

Final Grade: Reporter

☐ Novelty of the report

Final Grade: Opponent



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

do not bend

fight assistant, so we can scan it and

archive your partial grades - please



| 5 | CO | r | in | a | GI | ui | d | e | li | n | e | S |
|---|----|---|----|---|----|----|---|---|----|---|---|---|
|   |    |   | -  | 3 | •  | -  | • | _ |    |   |   |   |

|  | Fight (Round no.): Roor  | n: Stage: <u>3</u> Problem no <sub>:</sub> :   |
|--|--|--|
| Scoring Guideli  | nes Juror: Lobyshov  | _ Signature:   |
| A report should include:   |  |  |
| application of appropriate mathematics •   | epts, theories and principles of the problem • and reasonable experimental technique to gather and experimental findings to draw suitable conclusion and able manner   | record data (or demonstrate the phenomena if   |
| An opposition should show that • the opponent challenged the reporter's appropriate mathematics presented • the opponent appreciated and highlighted the | understanding of the presented concepts, theories opponent 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 controve   | ective summary of the performances the reporter ersial ones) • the reviewer's personal opinion was in non-trivial and demonstrated, where possible, the red by the reporter and the opponent                                   | n evidence (not just superficial observations) •   |
| <ul> <li>The reporter, opponent and reviewe</li> <li>Consider the following suggestions to</li> <li>Select each partial grade from each s</li> </ul>     | s consists of a partial grade for <i>physics, presen</i> r each start with 5 points. D add to or deduct from the initial 5 points. ection and write it in the corresponding box. no questions were posed or not finding shortc |  |
| Rep.: Izan   | Opp.: Korea  | Rev.: Singapore  |
| 5  | 5  | 5  |
| Physics ±3   | Physics ±3   | Physics ±3   |
| ☐ Correct and relevant physics   | ☐ Correct and relevant physics   | ☐ Correct and relevant physics   |
| ☐ Scientific approach  | ☐ Scientific approach  | ☐ Scientific approach  |
| ☐ Validity of conclusions  | ☐ Validity of conclusions  | ☐ Validity of conclusions  |
| Accurate answers   | ☐ Accurate answers   | ☐ Accurate answers   |
| Presentation ±1  | Presentation ±1  | Presentation ±1  |
| Clear and understandable   | Clear and understandable   | ☐ Clear and understandable   |
| Appropriate manner   | ☐ Appropriate manner   | ☐ Appropriate manner   |
| Overall impression   | Overall impression   | Overall impression   |
| Reporter ±1  | Opponent ±1  | Reviewer ±1  |
| Quality of experimental technique(s)   | Response to the reporter's solution  | Provides a thorough review of report and discussion  |
| Structure  | Shows the strong and weak points of the report   | Expresses own opinion about topics presented or discussed  |
| ☐ Explanation of formulae and symbols  | Finds shortcomings or errors in the report   | Relevance of questions to both the reporter and the opponent   |
| Appropriate models, conformity of dimensions   | Relevance of the questions   | ☐ Draws attention to points missed   |
| <ul><li>Slides, on-site experiments, audio, video, as appropriate</li></ul>  | ☐ 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 do a please archive your partial grades – please  |
| ☐ Contribution to the discussion   |  | do not bend  |

Final Grade: Reporter



Final Grade: Opponent





| S | COI | rine | q G | ui | dei | lin | es |
|---|-----|------|-----|----|-----|-----|----|
|   |     | -    |     |    |     |     |    |

| Fight (Round no.): +             | Room:          | Stag                 | e: <u>3</u> | Problem n   | o.: <u>11</u> |
|----------------------------------|----------------|----------------------|-------------|-------------|---------------|
| Juror: <u>Bylano</u>             | <u> </u>       | ignature:            | 3           | 9           |               |
| <b>nd principles</b> of the prob | olom a an avak | <b>nation</b> of the | ohsene      | l nhanamana |               |

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

#### An opposition should show that:

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

#### A review should show that:

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

8

Final Grade: Reporter

- Consider the following suggestions 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.: 1/21 5  | Opp.: Kovea 5                                 | Rev.: Singapare 5  |
| Physics ±3 +1½  | Physics ±3                                    | Physics ±3   |
| Correct and relevant physics                              | ☐ Correct and relevant physics                | ☐ Correct and relevant physics   |
| E Scientific approach                                     | ☐ Scientific approach                         | ☐ Scientific approach  |
|   | ☐ Validity of conclusions                     | ☐ Validity of conclusions  |
| ☐ Accurate answers  | ☐ Accurate answers                            | ☐ Accurate answers   |
| Presentation ±1   | Presentation ±1                               | Presentation ±1  |
| ☐ Clear and understandable                                | E Clear and understandable                    | ☐ Clear and understandable   |
| ☐ Appropriate manner                                      | ☐ Appropriate manner                          | ☐ Appropriate manner   |
| Overall impression  | □ Overall impression                          | Overall impression time management   |
| Reporter ±1 +½  | 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               | 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 | E 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 |
| 1 Novelty of the report                                   |   | fight assistant, so we con-<br>archive your partial grades – please        |
| Contribution to the discussion                            |   | do not bend  |

Final Grade: Opponent

# Scoring Guidelines

| Fight (Round no.): | Room: St   | tage: 3 Problem no.: // |
|--------------------|------------|-------------------------|
| Juror: t. ZADE     | Signature: | to for                  |

#### A report should include:

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for *physics*, *presentation* and for their *specific role*.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following *suggestions* to *add* to or *deduct* from the initial *5 points*.
- Select each partial grade from each section and write it in the corresponding box.
- Don't punish missing 'answers' when no questions were posed or not finding shortcomin

| and the state of t |   |   |  |  |
|--|---|---|--|--|
| Rep.:5   | Opp.:5  | <b>Rev.:</b> 5  |  |  |
| Physics ±3  Correct and relevant physics   | Physics ±3  ☐ Correct and relevant physics  | Physics ±3 ☐ Correct and relevant physics   |  |  |
| <ul><li>□ Scientific approach</li><li>□ Validity of conclusions</li><li>□ Accurate answers</li></ul>   | ☐ Scientific approach ☐ Validity of conclusions ☐ Accurate answers  | <ul><li>□ Scientific approach</li><li>□ Validity of conclusions</li><li>□ Accurate answers</li></ul>  |  |  |
| Presentation ±1  | Presentation ±1   | Presentation ±1   |  |  |
| <ul><li>☐ Clear and understandable</li><li>☐ Appropriate manner</li><li>☐ Overall impression</li></ul>   | <ul><li>☐ Clear and understandable</li><li>☐ Appropriate manner</li><li>☐ Overall impression</li></ul>  | ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  |  |  |
|  | <u> </u>  |   |  |  |
| 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 technique(s)  Structure  | Response to the reporter's  |   |  |  |
| Quality of experimental technique(s)  Structure  Explanation of formulae and symbols   | Response to the reporter's solution  Shows the strong and weak points   | 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 of dimensions  | Response to 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  |  |  |
| ☐ Quality of experimental technique(s) ☐ Structure ☐ Explanation of formulae and symbols ☐ Appropriate models, conformity of dimensions ☐ Slides, on-site experiments, audio, video, as appropriate  | 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                                      |  |  |
| <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> <li>☐ References, proper citations of ideas and input of others</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 |  |  |
| ☐ Quality of experimental technique(s) ☐ Structure ☐ Explanation of formulae and symbols ☐ Appropriate models, conformity of dimensions ☐ Slides, on-site experiments, audio, video, as appropriate  | Response to 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                                      |  |  |







| Scoring Guidelines | Scoring | Guidelines | F |
|--------------------|---------|------------|---|
|--------------------|---------|------------|---|

| Fight (Round no.): | Room:     | Stage: _    | 3 | Problem no.: | 11 |
|--------------------|-----------|-------------|---|--------------|----|
| Juror: Kathryn "   | Signature | :: <i>_</i> | 7 | dul          |    |

#### A report should include:

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

#### An opposition should show that:

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

#### A review should show that:

- the reviewer succeeded in giving an objective summary of the performances the reporter and opponent the reviewer appreciated the important aspects (especially the controversial ones) • the reviewer's personal opinion was in evidence (not just superficial observations) • such personal opinions were informative, non-trivial and demonstrated, where possible, the reviewer's understanding of concepts, theories, principles and appropriate mathematics used by the reporter and the opponent
- The grade for each of the three 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>Consider the following suggestions to add to or deduct from the initial 5 points.</li> <li>Select each partial grade from each section and write it in the corresponding box.</li> <li>Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.</li> </ul> |  |  |  |  |
|--|--|--|--|--|
| Rep.: 1 1 5  | Opp.: KOREA 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 for too   | ☐ Clear and understandable                 | Clear and understandable   |  |  |
| Appropriate manner quick   | ☐ Appropriate manner                       | Appropriate manner   |  |  |
| Overall impression   | Overall impression of                      | Overall impression   |  |  |
| Reporter ±1  | Spoke at little flat 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                              | Expresses own opinion about 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   |  |  |
| 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  |  | fight assistant, so we can be archive your partial grades – please         |  |  |
| Contribution to the discussion   |  | do not bend  |  |  |
| Final Grade: Reporter Ceft . Elle  | Final Grade: Opponent 10 Revised a         | Final Grade: Reviewer  Ifter IOC feedback and approved by EC on 2011-11-03 |  |  |

## **Scoring Guidelines**

| Fight (Round no.): | Room: Stage | : Problem no.: |
|--------------------|-------------|----------------|
| Juror: PCG SCET    | Signature:  | J Q            |

| Α | rep | ort | sho | uld | 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:

- the reviewer succeeded in giving an *objective summary* of the performances the *reporter* and *opponent* the reviewer appreciated the *important aspects* (especially the *controversial* ones) the reviewer's *personal opinion* was in evidence (*not* just *superficial observations*) such personal opinions were *informative*, *non-trivial* and demonstrated, where possible, the reviewer's *understanding* of *concepts*, *theories*, *principles* and *appropriate mathematics* used by the reporter and the opponent
- The grade for each of the three teams consists of a partial grade for *physics*, *presentation* and for their *specific role*.
- The reporter, opponent and reviewer each start with 5 points.
- Consider the following suggestions 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 questions were posed or not finding shortcomings if there were none to find.</li> </ul> |   |   |  |  |
|---|---|---|--|--|
| Rep.:5  | Opp.:5  | Rev.:5  |  |  |
| Physics ±3  ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions  | Physics ±3  Correct and relevant physics Scientific approach Validity of conclusions          | Physics ±3  ☐ Correct and relevant physics ☐ Scientific approach ☐ Validity of conclusions                                  |  |  |
| Accurate answers  Presentation ±1   | ☐ Accurate answers  Presentation ±1   | ☐ Accurate answers  Presentation ±1   |  |  |
| <ul><li>☐ Clear and understandable</li><li>☐ Appropriate manner</li><li>☐ Overall impression</li></ul>                                  | ☐ Clear and understandable☐ Appropriate manner☐ Overall impression                            | ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression  |  |  |
| 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  |  |  |
| <ul><li>Structure</li><li>Explanation of formulae and symbols</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                               |  |  |
| <ul> <li>□ Appropriate models, conformity of dimensions</li> <li>□ Slides, on-site experiments, audio, video, as appropriate</li> </ul> | ☐ 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  Novelty of the report  Contribution to the discussion                        |   | This sheet will be collected by the fight assistant, so we can scan it and archive your partial grades — please do not bend |  |  |
| contribution to the discussion  |   | ab not being  |  |  |

Final Grade: Reporter

Final G

I Grade: Opponent

9

Final Grade: Reviewer



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

| S | CO | rin | q G | uia | lel | ines |
|---|----|-----|-----|-----|-----|------|
| _ |    |     | , – |     |     |      |

|  | >  |  |
|--|--|--|
| Scoring Guideli  | Fight (Round no.): 6 Room  Nes  Juror: Ohman MARI  | n: 777 Stage: 3 Problem no.: 1   |
| application of appropriate mathematics •   | pts, theories and principles of the problem • an erreasonable experimental technique to gather and experimental findings to draw suitable conclusionable manner  | record data (or demonstrate the phenomena if   |
| An opposition should show that  the opponent challenged the reporter's u   | :<br>understanding of the presented concepts, theories<br>opponent critiqued the experimental technique use  | and <i>principles</i> • the opponent understood the d and questioned the <i>validity</i> of the <i>data</i> • the                                |
| important aspects (especially the controver  | ective summary of the performances the reporter rsial ones) • the reviewer's personal opinion was in on-trivial and demonstrated, where possible, the red 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</i> , <i>present</i> each <i>start with 5 points</i> .  a <i>add</i> 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 shortcomes. |  |
| Rep.:  | Opp.: Korea 5  | Rev.: Singapore 5  |
| hysics ±3  | Physics ±3   | Physics ±3   |
| Correct and relevant physics Scientific approach Validity of conclusions Accurate answers                        | <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> |
| resentation ±1  Clear and understandable   | Presentation ±1  | Presentation ±1  |
| Appropriate manner Overall impression  | ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression   | ☐ Clear and understandable ☐ Appropriate manner ☐ Overall impression   |
| eporter ±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  Explanation of formulae and   | Shows the strong and weak points of the report   | Expresses own opinion about topics presented or discussed  |
| Explanation of formulae and symbols  | Finds shortcomings or errors in the report   | Relevance of questions to both the reporter and the opponent   |
| Appropriate models, conformity of dimensions   | Relevance of the questions   | ☐ Draws attention to points missed   |
| Slides on-site experiments audio   | ☐ Combatter of the first   | by the reporter or the opponent  |

# Reporter ±1

☐ Clear and understandable

☐ Appropriate manner

Overall impression

☐ Correct and relevant physics

☐ Validity of conclusions

☐ Accurate answers

Presentation ±1

Quality of experimental technique(s)

☐ Structure

Physics ±3

Explanation of formulae and symbols

☐ Appropriate models, 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

☐ Contribution to the discussion



Final Grade: Reviewer

do not bend



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

This sheet will be collected by the

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

| Sco | ring | Gu | ide | lines |
|-----|------|----|-----|-------|
|     |      |    |     |       |

| Fight (Round no.): Fiwi Room: Stage: Problem no.: |
|---|
| Juror: Vy MARTCHENO Signature:                    |
|   |

Final Grade: Reviewer Final Grade: 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:

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>Consider the following suggestions to add to or deduct from the initial 5 points.</li> <li>Select each partial grade from each section and write it in the corresponding box.</li> <li>Don't punish missing 'answers' when no questions were posed or not finding shortcomings if there were none to find.</li> </ul> |  |  |  |  |
|--|--|--|--|--|
| Rep.:   Pah 5  | Opp.: Korea 5                              | Rev.: Singa poli 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  |  |  |
| 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 grades  |  |  |
| Contribution to the discussion   |  | do not bend  |  |  |
|  | (%)  |  |  |  |

Final Grade: Opponent