

Annual Examinations for Secondary Schools 2014

FORM 4

PHYSICS

MARKING SCHEME

| SECTION A | | 70 MARKS | |
|-----------|-----------------|----------|-----------------------|
| Question | Answer | Mark | Additional Guidelines |
| 1 a (i) | C | 1 | |
| 1 a (ii) | A | 1 | |
| 1 b (i) | 8 waves | 1 | |
| 1 b (ii) | 5 cm | 1 | |
| 1 b (iii) | 0.125 s, 8 Hz | 2 | |
| 1 b (iv) | Decreases, Same | 2 | |

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|-----------|------------------------|---|--|
| 2 a (i) | Reflection, Refraction | 2 | |
| 2 a (ii) | Correct Ray Drawings | 2 | |
| 2 b (i) | Convex Lens | 1 | |
| 2 b (ii) | 2 | 1 | |
| 2 b (iii) | Virtual, Upright | 2 | |

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|----------|--|---|--|
| 3 a | Correct drawing of: a force by the man on the wall, the reaction force of the wall on the man. | 2 | |
| 3 b | 100 N | 1 | |
| 3 c | Newton's Third Law | 1 | |
| 3 d (i) | Friction, equal to 8.0 N | 2 | |
| 3 d (ii) | 0.6 N, 0.2 m/s ² | 2 | |

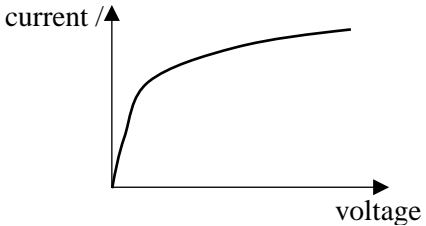
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|-----|---|---|--|
| 4 a | To check for broken bones | 1 | |
| 4 b | 4.28×10^{-10} m | 2 | |
| 4 c | Same speed, Transverse | 2 | |
| 4 d | Radio Waves Infra-Red Radiation Visible Light | 3 | |

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| 5 a | Thermistor | 1 | |
| 5 b | 0.1 A | 2 | |
| 5 c | 120 Ω | 2 | |
| 5 d | 400 Ω | 2 | |
| 5 e | The current would decrease since the total resistance of the thermistor and the 100 Ω in parallel increases with decreasing temperature. | 1 | accept any other explanation that is similar to the one given |

| SECTION B | | 45 marks | |
|------------------|--|-------------|---|
| Question | Answer | Mark | Additional Guidelines |
| 6 a | Correct Graph | 5 | 1 mark for correct labelling of axes 1 mark for graph title 2 marks for correct plotting of graph 1 mark for correct size of graph |
| 6 b (i) | 27 00 kg m/s | 2 | 1 mark for correct unit |
| 6 b (ii) | 0 kg m/s | 1 | |
| 6 b (iii) | 20 m/s ² | 2 | |
| 6 b (iv) | 1800 N | 2 | 1 mark for correct unit |
| 6 c | Decreases | 1 | |
| 6 d | Choose 2 from: safety belts, crumple zones or air bags and headrests | 2 | |

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| 7 a (i) | constant | 1 | |
| 7 a (ii) | accelerating | 1 | |
| 7 a (iii) | 16 | 1 | |
| 7 a (iv) | 0.02 m/s ² | 2 | |
| 7 a (v) | 13440 m | 2 | |
| 7 a (vi) | 11.20 m/s | 2 | |
| 7 b (i) | Weight | 1 | |
| 7 b (ii) | 45 m | 2 | |
| 7 b (iii) | 30 m/s | 2 | |
| 7 b (iv) | Equal to | 1 | |

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|------------------|--|---|---|
| 8 a (i) | Through friction, one sphere loses electrons and the other sphere gains electrons. | 2 | accept any other suitable description |
| 8 a (ii) | Attraction | 1 | |
| 8 a (iii) | 3.2×10^{-6} A | 2 | |
| 8 b (i) | Correct circuit diagram that shows all the component symbols connected in series. 1 mark for correct symbol of ammeter. 1 mark for correct symbol of switch and lamp 1 mark for correct symbol of ammeter and variable resistor | 3 | accept any other order of position of components than the one given as long as the components are connected in series |
| 8 b (ii) | Correct circuit symbol of a voltmeter is drawn connected parallel to the lamp. | 1 | |

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| 8 b (iii) | <p>The variable resistor is set to maximum resistance.</p> <p>The switch is closed and the voltmeter and ammeter readings are noted.</p> <p>The variable resistor is set to a different value.</p> <p>The experiment is repeated and each time the values of the current and voltage are recorded.</p> | <p>1</p> <p>1</p> <p>1</p> <p>1</p> | <p>accept any other similar procedures</p> |
| 8 b (iv) |  | <p>1</p> | |
| 8 b (v) | <p>No</p> | <p>1</p> | |

Please Note: When marking questions that involve calculations, apply the ‘**follow through**’ rule. This means that if a student gives a wrong value for part (a) of a question and then uses the value of (a) in the subsequent calculations, marks should be deducted for part (a) only. The subsequent parts should be given full marks if these are correct.