



2015 Physics

Intermediate 1

Finalised Marking Instructions

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Part One: General Marking Principles for Physics Intermediate 1

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

- (a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor.
- (b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Physics Intermediate 1

The marking schemes are written to assist in determining the “minimal acceptable answer” rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates’ evidence, and apply to marking both end of unit assessments and course assessments.

The current in a resistor is 1.5 amperes when the potential difference across it is 7.5 volts. Calculate the resistance of the resistor.

	Answers	Mark + Comment	Issue
1.	$V=IR$ $7.5=1.5R$ $R=5.0 \Omega$	($\frac{1}{2}$) ($\frac{1}{2}$) (1)	Ideal answer
2.	5.0Ω	(2) Correct answer	GMI 1
3.	5.0	($1\frac{1}{2}$) Unit missing	GMI 2 (a)
4.	4.0Ω	(0) No evidence/wrong answer	GMI 1
5.	_____ Ω	(0) No final answer	GMI 1
6.	$R = \frac{V}{I} = \frac{7.5}{1.5} = 4.0\Omega$	($1\frac{1}{2}$) Arithmetic error	GMI 7
7.	$R = \frac{V}{I} = 4.0\Omega$	($\frac{1}{2}$) Formula only	GMI 4 and 1
8.	$R = \frac{V}{I} = \text{_____} \Omega$	($\frac{1}{2}$) Formula only	GMI 4 and 1
9.	$R = \frac{V}{I} = \frac{7.5}{1.5} = \text{_____} \Omega$	(1) Formula + subs/No final answer	GMI 4 and 1
10.	$R = \frac{V}{I} = \frac{7.5}{1.5} = 4.0$	(1) Formula + substitution	GMI 2 (a) and 7
11.	$R = \frac{V}{I} = \frac{1.5}{7.5} = 5.0\Omega$	($\frac{1}{2}$) Formula but wrong substitution	GMI 5
12.	$R = \frac{V}{I} = \frac{7.5}{1.5} = 5.0\Omega$	($\frac{1}{2}$) Formula but wrong substitution	GMI 5
13.	$R = \frac{I}{V} = \frac{7.5}{1.5} = 5.0\Omega$	(0) Wrong formula	GMI 5
14.	$V = IR$ $7.5 = 1.5 \times R$ $R = 0.2 \Omega$	($1\frac{1}{2}$) Arithmetic error	GMI 7
15.	$V = IR$ $R = \frac{I}{V} = \frac{1.5}{7.5} = 0.2\Omega$	($\frac{1}{2}$) Formula only	GMI 20

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Part Two: Marking Instructions for each Question

Section A

Question	Expected Answer(s)	Max Mark
1.	E	1
2.	C	1
3.	A	1
4.	B	1
5.	B	1
6.	E	1
7.	B	1
8.	A	1
9.	A	1
10.	E	1

Question	Expected Answer(s)	Max Mark
11.	D	1
12.	D	1
13.	E	1
14.	B	1
15.	E	1
16.	B	1
17.	E	1
18.	C	1
19.	E	1
20.	A	1

Section B

Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin
21. (a) television		1	5
(b) red, green and blue	All three must be correct 1 or 0	1	
(c) False True True True	½ each	2	
(d) so the satellite aerial does not have to move		1	

Sample Answer and Mark Allocation				Notes	Inner Margin	Outer Margin
22. (a)				½ mark each	2	6
<i>Subsea Cable Name</i>	<i>Cable Material</i>	<i>Type of Signal Carried</i>	<i>Speed of Signal in Cable (metres per second)</i>			
Atlantic Crossing 1	<i>Optical Fibre</i>	LIGHT	200000000			
TAT -7	Metal Wire	electrical	300000000			
(b)	a long thin strand of glass				1	
(c)	any suitable advantage of optical fibres over electrical cables				1	
(d)	diagram completed to show no more than 3 reflections				1	
(e)	cable could be damaged (½) caused by submarines/fishing nets/water pressure (½)				1	

Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin
23. (a) series		1	6
(b) resistance = voltage/current resistance = $1.5/0.02$ resistance = 750 ohms	Standard 2 marks	2	
(c) (i) decreases		1	
(c) (ii) less current		1	
(d) any suitable answer		1	


Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin
24. (a) (i) infra red, IR		1	8
(a) (ii) any suitable		1	
(b) (i) ultraviolet		1	
(b) (ii) skin cancer		1	
(c) one from: radio, TV, microwave, X-ray, gamma		1	
(d) $230-45 = 185$ volts	1 mark for 230V	2	
(e) LDR		1	

Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin
25. (a) (i) gamma		1	5
(a) (ii) to penetrate through the road		1	
(b) at 130 metres		1	
(c) any suitable		1	
(d) it decreases		1	

Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin
26. (a) ultrasound		1	5
(b) (i) 0.1 seconds		1	
(b) (ii) speed=distance/time speed = 35/0.1 speed = 350 metres per second	standard 2 mark	2	
(c) unbalanced		1	

Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin
27. (a) (i) A		1	6
(a) (ii) A		1	
(a) (iii) octave decibel		1 1	
(b) (i) X		1	
(b) (ii) lowest tension and longest string	1 or 0	1	

Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin
28. (a) weight = mass \times 10 weight = 10 000 \times 10 weight = 100 000 Newtons	standard 2 mark	2	8
(b) average speed = distance/time average speed = 99/5.5 average speed = 18 metre per second	standard 2 mark	2	
(c) friction and engine force	1 each	2	
(d) (i) increases		1	
(d) (ii) decreases		1	

Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin						
29. (a) (i) 		1	7						
(a) (ii) NOT gate		1							
(a) (iii) <table border="1" data-bbox="469 539 753 647" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> </tr> </tbody> </table>	Input	Output	0	1	1	0		1	
Input	Output								
0	1								
1	0								
(b) 300 000 000 metres per second		1							
(c) high		1							
(d) the buzzer would never sound the AND gate requires both input to be 1 before the output is 1		1 1							

Sample Answer and Mark Allocation	Notes	Inner Margin	Outer Margin
30. (a) (i) ohmmeter		1	4
(a) (ii) description of procedure thermometer used to measure temperature ohmmeter used to measure resistance		1 ½ ½	
(b) any suitable		1	

[END OF MARKING INSTRUCTIONS]