MODUL PENINGKATAN PRESTASI TINGKATAN 5

TAHUN 2014

MAJLIS PENGETUA SEKOLAH MALAYSIA (KEDAH)

MODUL 1

FIZIK

Kertas 3

Peraturan Pemarkahan

BAHAGIAN A

Soalan		Cadangan Jawapan	Markah
1(a)	(i)	Angle of incidence	1
	(ii)	Angle of refraction	1
	(iii)	Refractive index of the glass block	1
(b)	(i)	19^o, 25^o, 30^o, 36^o [4 correct: 2 marks; 3 correct: 1 mark]	2
	(ii)	sin i = 0·50, 0·64, 0·77, 0·87 sin r = 0·33, 0·42, 0·50, 0·59	1 1
(c)		Table with 4 columns i, r, sin i, sin r All values transferred correctly All values of sin i and sin r to 2 d.p.	1 1 1
(d)		sin i at the y-axis, sin r at the x-axis ✓ sin i and sin r without any units ✓ Uniform scale for both axes ✓ 5 points plotted correctly ✓✓ [4 points correct: ✓] Best straight line ✓ Size of graph ✓ 7✓ : 5 marks 5-6✓ : 4 marks 3-4✓ : 3 marks 2✓ : 2 marks 1✓ : 1 mark	5
(e)		sin i is directly proportional to sin r	1
			16
2(a)	(i)	h is directly proportional to m	1
	(ii)	Intrapolation line h = 0·024	1 1
	(iii)	Triangle drawn $k = \frac{0{\cdot}072}{0{\cdot}6}$ k = 0·12	1 1 1
(b)		$\rho = \frac{1}{0{\cdot}12\ \text{m kg}^{-1} \times 4{\cdot}0 \times 10^{-3}\ \text{m}^2}$ ρ = 2083 kg m^{-3} [1 mark for correct unit]	1 1+1
(c)		$F = 2083 \times 10 \times 5{\cdot}0 \times 10^{-4}$ F = 10·42	1 1
(d)		The eye must be perpendicular to the scale of the ruler to avoid parallax error // Any suitable precaution	1
			12

BAHAGIAN B

<table>
<tr><th>Soalan</th><th>Cadangan Jawapan</th><th>Markah</th></tr>
<tr><td>3(a)</td><td>The object distance affects the image distance</td><td>1</td></tr>
<tr><td>(b)</td><td>The bigger the object distance, the smaller the image distance</td><td>1</td></tr>
<tr><td>(c) (i)</td><td>To investigate the relationship between the object distance and image distance</td><td>1</td></tr>
<tr><td>(ii)</td><td>MV : Object distance, u
RV : Image distance, v
CV : Focal length of the lens, f</td><td>1
1
1</td></tr>
<tr><td>(iii)</td><td>Light bulb, power supply, connecting wires, convex lens, screen, metre rule</td><td>1</td></tr>
<tr><td>(iv)</td><td>Arrangement with light bulb connected to power supply, convex lens and screen along a straight line</td><td>1</td></tr>
<tr><td>(v)</td><td>1. The lens is placed at a distance, u = 15 cm from the light bulb.
2. The power supply is switched on. The screen is adjusted until a clear and sharp image is formed. The distance, v, from the lens to the screen is measured with a metre rule.
3. Steps 1 and 2 are repeated with u = 20 cm, 25 cm, 30 cm and 35 cm.</td><td>1

1
1</td></tr>
<tr><td>(vi)</td><td><table><tr><th>u / cm</th><th>v / cm</th></tr><tr><td>15</td><td></td></tr><tr><td>20</td><td></td></tr><tr><td>25</td><td></td></tr><tr><td>30</td><td></td></tr><tr><td>35</td><td></td></tr></table></td><td>1</td></tr>
<tr><td>(vii)</td><td>A graph of v against u is drawn.</td><td>1</td></tr>
<tr><td></td><td>Maximum</td><td>12</td></tr>
<tr><td>4(a)</td><td>The diameter / thickness / cross-sectional area of a wire affects the resistance of the wire</td><td>1</td></tr>
<tr><td>(b)</td><td>The bigger the diameter / thickness / cross-sectional area, the smaller the resistance</td><td>1</td></tr>
<tr><td>(c) (i)</td><td>To investigate the relationship between the diameter / thickness / cross-sectional area and the resistance of the wire</td><td>1</td></tr>
<tr><td>(ii)</td><td>MV : diameter, d / thickness / cross-sectional area
RV : Resistance, R
CV : Length of the wire</td><td>1
1
1</td></tr>
<tr><td>(iii)</td><td>Constantan wires of different diameters, metre rule, ammeter, voltmeter, battery, swirch, connecting wires</td><td>1</td></tr>
<tr><td>(iv)</td><td>Circuit diagram with battery, switch and constantan wire. The ammeter is connected in series to the constantan wire and the voltmeter is connected to the constantan wire.</td><td>1
1</td></tr>
<tr><td>(v)</td><td>1. A constantan wire of diameter, d = 0·5 mm is connected in the circuit.
2. The switch is closed. The readings of the ammeter and voltmeter are recorded. The resistance, R, is calculated using the formula $R = \frac{V}{I}$.
3. Steps 1 and 2 are repeated with constantan wires of diameter of, d = 1.0 mm, 1.5 mm, 2.0 mm and 2.5 mm</td><td>1</td></tr>
<tr><td>(vi)</td><td><table><tr><th>d / mm</th><th>I / A</th><th>V / V</th><th>R / Ω</th></tr><tr><td>0.5</td><td></td><td></td><td></td></tr><tr><td>1.0</td><td></td><td></td><td></td></tr><tr><td>1.5</td><td></td><td></td><td></td></tr><tr><td>2.0</td><td></td><td></td><td></td></tr><tr><td>2.5</td><td></td><td></td><td></td></tr></table></td><td>1
1</td></tr>
<tr><td>(vii)</td><td>A graph of R against d is drawn</td><td>1</td></tr>
<tr><td></td><td>Maximum</td><td>12</td></tr>
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