Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/32**

Paper 3 Theory (Core) **March 2021**

MARK SCHEME

Maximum Mark: 80

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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[Turn over

Question	Answer	Marks
1(a)	(kinetic energy / it) increases	**B1**
	(because) speed / velocity (of box) increases OR faster	**B1**
1(b)	(gravitational potential energy) decreases	**M1**
	(because) height (of box) decreases	**A1**
1(c)(i)	any indication on graph / in text that horizontal section represents steady speed	**C1**
	10 (m / s)	**A1**
1(c)(ii)	(resultant vertical force =) zero OR 0 (N)	**B1**
1(d)	distance = area under graph OR ½ × b × h	**C1**
	(distance =) ½ × 6.0 × 45	**C1**
	135 (m)	**A1**
1(e)	deceleration (line) is steeper OR higher gradient than acceleration (line)	**B1**

Question	Answer	Marks
2(a)	(volume =) difference in candidate's readings	**C1**
	24 (cm^3)	**A1**
2(b)	(density =) mass ÷ volume	**C1**
	(density =) 98.4 ÷ 41.0	**C1**
	2.4(0) (g / cm^3)	**A1**

Question	Answer	Marks
2(c)	idea that mass is (a measure of) amount of matter in a body	**B1**
	idea that weight is a gravitational force	**B1**

Question	Answer	Marks
3(a)	(moment of force =) force × (perpendicular) distance of force from pivot	**B1**
	5.2 × 6.0	**B1**
	31.2	**B1**
3(b)	(sum of) clockwise moment(s) = (sum of) anticlockwise moment(s)	**C1**
	P × 2.0 + 8.1 × 2.0 = 5.2 × 6.0 OR 31.2 OR answer from (a)	**C1**
	P = (31.2 – 16.2) ÷ 2.0 OR 15 ÷ 2.0	**C1**
	7.5 (N)	**A1**

Question	Answer	Marks
4(a)	(part A) turbine	**B1**
	(part B) generator	**B1**
4(b)	any 2 valid examples of renewable energy from: sunlight wind wave hydroelectric biofuels/biomass tidal	**B2**
4(c)	any 2 from: does not produce carbon dioxide OR does not contribute to global warming no sulphur dioxide or nitrous oxides produced no mining needed for fuel	**B2**

Question	Answer	Marks
5(a)(i)	(weight =) mass × g OR 1.6 × 10 OR mass = W ÷ g	**C1**
	(weight =) 16 (N)	**A1**
5(a)(ii)	(pressure =) force ÷ area	**C1**
	(pressure =) 16 ÷ 18	**C1**
	(pressure =) 0.89 (N / cm^2)	**A1**
5(b)	1 (volume of block) increases	**B1**
	2 (mass) remains constant owtte	**B1**
	3 (density) decreases	**B1**

Question	Answer	Marks
6(a)(i)	angle of incidence correctly identified (with × between normal and incident ray)	**B1**
6(a)(ii)	refraction	**B1**
6(a)(iii)	normal (line)	**B1**
6(b)(i)	62°	**B1**
6(b)(ii)	reflection	**C1**
	total internal reflection	**A1**
6(c)	ray refracted away from normal	**B1**

Question	Answer	Marks
7(a)	1 (amplitude of wave = arrow) **R**	**B1**
	2 (wavelength of wave = arrow) **S**	**B1**
7(b)	(frequency =) number of (complete) waves per second	**C1**
	(frequency =) 12 ÷ 8	**C1**
	1.5 (Hz)	**A1**
7(c)	vibration(s) OR oscillation(s)	**B1**
	in transverse waves is / are perpendicular / at right angles to the direction of energy transfer / wave travel	**B1**
	in longitudinal waves is / are in same direction OR parallel to the direction of energy transfer / wave travel	**B1**

Question	Answer	Marks
8(a)(i)	(plotting) compass OR iron filings	**B1**
	detail of method	**B1**
	use of (plotting) compass to give direction of field	**B1**
8(a)(ii)	steel	**B1**
8(b)(i)	reverse magnetic field owtte OR reverse current in wire	**B1**
8(b)(ii)	force is weaker	**B1**
	(because) magnetic field is weaker	**B1**

Question	Answer	Marks
9(a)	V= IR or (R =) V / I	**C1**
	5.6 ÷ 0.04	**C1**
	140 (Ω)	**A1**
9(b)	(current in thermistor) increases	**B1**
	(because) resistance of thermistor decreases	**B1**
9(c)	fire / high temperature alarm / warning	**B1**

Question	Answer	Marks
10(a)	electrocution OR overheating / fire	**B1**
10(b)	large current (in fuse)	**B1**
	(causes) fuse / it to melt	**B1**
	isolating appliance from supply OR prevents current in appliance OR breaks circuit	**B1**
10(c)	$V_s / V_p = N_s / N_p$	**C1**
	$V_s / 120 = 200 / 2000$ OR $V_s = 120 \times 200 / 2000$ OR $V_s = 120 / 10$	**C1**
	12 (V)	**A1**
10(d)	(soft) iron	**B1**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>11(a)</td><td>
<table>
<tr><td></td><td>carbon-12</td><td>carbon-14</td><td></td></tr>
<tr><td>number of electrons</td><td>6</td><td>6</td><td>B1</td></tr>
<tr><td>number of protons</td><td>6</td><td>6</td><td>B1</td></tr>
<tr><td>number of neutrons</td><td>6</td><td>8</td><td>B1</td></tr>
</table>
</td><td>3</td></tr>
<tr><td rowspan="2">11(b)</td><td>any indication on graph of line from 8000</td><td>C1</td></tr>
<tr><td>5600 (years)</td><td>A1</td></tr>
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