



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS

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Paper 3 Core Theory

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MARK SCHEME

Maximum Mark: 80

Published

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This document consists of **9** printed pages.



Question	Answer	Marks
1(a)	top box ticked: density	B1
1(b)	2500 (g)	B1
1(c)	$W = mg$ in any form	C1
	$(2.5 + 1.0 + 0.5) = 4$	C1
	40	A1
	N or newtons	B1

Question	Answer	Marks
2(a)	line starts from 0 on y-axis straight diagonal line to 10 m/s line parallel to time axis straight diagonal line to x-axis at greater time (from horizontal section) line drawn to time axis at (85, 0)	B5
2(b)	speed = distance $\div$ time in any form OR (distance =) speed $\times$ time	C1
	7.5×150	C1
	1125 (m)	A1

Question	Answer	Marks
3(a)(i)	gravity OR weight	B1
3(a)(ii)	4.0 (N)	B1

Question	Answer	Marks
3(b)	4.8 (N)	B1
	Up(wards)	B1
3(c)(i)	energy cannot be created or destroyed (but can be transformed)	B1
3(c)(ii)	PE / KE / elastic energy of load / spring decreases / is transformed	B1
	Any one from: to thermal energy (which is) dissipated (to surroundings)	B1

Question	Answer	Marks
4(a)(i)	tick in top two boxes: distance AND force	B1
4(a)(ii)	first word circled: joule	B1
4(b)	tick in top AND bottom boxes: energy transferred AND time	B1
4(c)	clockwise moment = anticlockwise moment	C1
	$1.5 \times 30\,000 = 1 \times (\text{load})$	C1
	(load =) 45 000 (N)	A1
4(d)(i)	centre of mass in centre of load	B1
4(d)(ii)	centre of mass (moves) closer to pivot (point)	B1

Question	Answer	Marks
5(a)	sun(light)	B1
	electrical	B1
5(b)(i)	Any two from: uses a renewable source of energy no cost for source of energy no polluting / greenhouse gases OR no carbon dioxide produced easy to erect and dismantle conserves fossil fuels	B2
5(b)(ii)	Any ONE from: does not work at night need large area of land (for sufficient output)	B1
5(c)	idea that (panel can) follow the sun as it moves across the sky OR will absorb more energy OR transfer energy / work more efficiently	B1

Question	Answer	Marks
6(a)(i)	arrow upwards from heating element	B1
	arrow across top OR down on opposite side	B1
6(a)(ii)	warm air expands	B1
	(air) becomes less dense	B1
	(air) rises	B1
6(a)(iii)	radiation	B1
6(b)	on ceiling	B1

Question	Answer	Marks
7	change in direction of light when entering a medium – refraction very high frequency sounds – ultrasound a glass prism producing a spectrum – dispersion light spreading after passing through a narrow gap – diffraction sound reflecting from a wall – echo	B5

Question	Answer	Marks
8(a)	In order from left to right: γ / gamma (rays) X-rays infrared (rays / waves) microwaves	B4
8(b)	sun beds OR security marking	B1

Question	Answer	Marks
9(a)	(Fig. 9.1 is a) parallel (circuit)	B1
	(Fig. 9.2 is a) series (circuit)	B1
9(b)	Any two from: lamps less bright if one lamp breaks the other does not light lamps cannot be switched independently	B2
9(c)	two correct switch symbols	B1
	switch on each branch	B1

Question	Answer	Marks
9(d)	(K W) on	B1
	(J W) off	B1
	(J Z) on	B1

Question	Answer	Marks
10(a)	clamp AND nail to conductor AND stirrup AND thread to insulator	B1
10(b)	rubbed with a cloth	B1
	electrons transfer to polythene / from cloth	B1
10(c)	(bring) a negatively charged rod / strip / object near	B1
	repulsion	B1

Question	Answer	Marks
11(a)	T P (S) R Q	B3
11(b)	(soft) iron	B1
	(forms a) <u>temporary</u> magnet	B1

Question	Answer	Marks
12(a)	(neutron) – 125 – neutral	B2
	proton(s) – 85 – (positive)	B2
12(b)(i)	curve of negative gradient, gradient decreasing	B1
	curve with negative gradient starts on y axis	B1
12(b)(ii)	0.125 (kg) (remaining)	C1
	two half-lives indicated	C1
	16 hours	A1