



Cambridge IGCSE™

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 **14** printed pages.

Question	Answer	Marks
1(a)	12.0 (s)	B1
1(b)	(distance = 100 – 96 =) 4.0 (m)	B1
1(c)	(av. speed =) distance $\div$ time in any form	C1
	(av. speed =) 100 $\div$ 12.0	C1
	(av. speed =) 8.3 (m / s)	A1
1(d)	(student Q)	M0
	the steeper the line the faster(the runner) ORA	A1

Question	Answer	Marks
2(a)	(1100 – 400 =) 700 (g)	B1
2(b)	density = mass $\div$ volume OR $\rho = m \div V$ in any form	C1
	(ρ =) 700 $\div$ 750	C1
	(ρ =) 0.93 (g / cm ³)	A1
2(c)	400 (g) = 0.4 (kg)	B1
	$w = m \times g$ in any form	C1
	0.4 $\times$ 10	C1
	(weight =) 4(.0) (N)	A1

Question	Answer	Marks
3(a)(i)	900 – (300 + 250)	C1
	350 (N)	A1
	(direction of resultant force =) forwards	B1
3(a)(ii)	any two from: - friction (in the brakes) (transfers 100 kJ OR kinetic energy) into thermal energy (store) OR internal energy (store) - of brakes / car / surroundings OR is dissipated OR (transferred) into surroundings / environment	B2
3(b)	(moment =) force $\times$ (perpendicular) distance (from pivot)	C1
	(moment =) 35×20	C1
	(moment =) 700	A1
	Ncm	B1

Question	Answer	Marks
4(a)	G D C A F B E	B3
4(b)	any two from: - produces CO₂ OR contributes to global warming / greenhouse effect - mining damages landscape - produces atmospheric pollution - produces SO₂ / NO_x / acid rain - soot / particulates / smoke (produced) - pollution caused by transporting coal (from mine)	B2
4(c)(i)	no change (in work done) OR (work done is) same owtte	B1
4(c)(ii)	(output power) increases	B1

Question	Answer	Marks
5(a)(i)	$(P =) F \div A$ in any form	C1
	$(P =) 60 \div 80$	C1
	$(P =) 0.75 \text{ (N / cm}^2\text{)}$	A1
5(a)(ii)	$760(.0) + \text{OR} - 100(.0)$	C1
	860 (mm of Hg)	A1
5(b)	pressure decreases	B1
	Any two from: (because) molecules slower speed or less kinetic energy fewer collisions OR molecules collide less often (with walls of container) collides with less force (with walls of container)	B2

Question	Answer	Marks
6(a)	A: melting	B1
	B: evaporating / boiling / vapourising	B1
	C: freezing / solidifying	B1
6(b)	$1(.0) \text{ cm} = 10 \text{ }^\circ\text{C}$ OR $(6(.0) - 1(.0)) = 5$	B1
	$\frac{5 \times 100}{11 - 1}$	C1
	(temperature =) $50 \text{ (}^\circ\text{C)}$	A1

Question	Answer	Marks
7(a)(i)	50°	B1
7(a)(ii)	normal correctly positioned	B1
	correct reflected ray at 50° to normal	B1
7(b)(i)	12 (cm)	B1
7(b)(ii)	21 (cm)	B1
7(b)(iii)	inverted	B1
	smaller / diminished	B1

Question	Answer	Marks
8(a)(i)	microwave	B1
8(a)(ii)	ultraviolet / UV OR X-ray OR γ / gamma (rays)	B1
8(b)(i)	20 to 20 000	B1
	Hz or hertz	B1
8(b)(ii)	(note B has) smaller amplitude OR <u>note A</u> has larger amplitude	B1
	(note B has) lower frequency OR longer wavelength OR <u>note A</u> has higher frequency OR shorter wavelength	B1

Question	Answer	Marks
9	1 (bar P–Q is a) (permanent) magnet	M1
	(because magnet) repels end Q	A1
	2 (bar R–S is an) unmagnetised magnetic material	M1
	(because magnet) attracts both ends (of R–S)	A1

Question	Answer	Marks
10(a)(i)	correct symbol for voltmeter correctly connected	B1
10(a)(ii)	electrons	B1
10(a)(iii)	(current in CD) decreases	B1
	(because thinner wire / CD has) increased / bigger resistance	B1
10(a)(iv)	volt(s)	B1
10(b)(i)	16.1 (Ω)	B1
10(b)(ii)	0.40 (A)	B1

Question	Answer	Marks
11(a)(i)	3 (electrons)	B1
11(a)(ii)	7 (is the nucleon number)	B1
11(a)(iii)	4 (neutrons)	B1

Question	Answer	Marks
11(b)	(four days is) 2 half-lives	C1
	activity is $2400 \div 4$	C1
	600 (counts / minute)	A1

Question	Answer	Marks
12(a)	any three from: current in relay coil produces magnetic field relay / switch R is closed heater connected to 120 V or switches on	B3
12(b)	$V_s / V_p = N_s / N_p$ in any form	C1
	$(V_s =) (60 \times 120) \div 480$ OR $120 \div 8$	C1
	15 (V)	A1