



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 **11** printed pages.

Question	Answer	Marks
1(a)(i)	4.3 (cm)	A2
	5.8 (– 1.5)	C1
1(a)(ii)	(a)(i) ÷ 8 correctly evaluated (0.54 (cm) if 4.3 cm used)	A2
	(a)(i) ÷ 8	(C1)
1(b)	7.8 (g / cm ³)	A3
	54 ÷ 6.9	(C2)
	$D = m \div v$ in any form	(C1)

Question	Answer	Marks
2(a)(i)	ST OR WX	B1
2(a)(ii)	XY	B1
2(a)(iii)	TW OR XY	B1
2(b)	(distance travelled =) 100 (m)	A3
	(distance travelled =) 8×13	(C2)
	(distance travelled =) area under graph OR $b \times h$	(C1)
2(c)(i)	60 (N)	B1
2(c)(ii)	accelerates OR increases speed	B1

Question	Answer	Marks
3(a)	chemical (energy)	B1
	light (energy)	B1
	30 (J)	B1
3(b)	6.8 (J)	A3
	(work done =) $8.5 \times 0.8(0)$	(C2)
	(work done =) force $\times$ distance (moved)	(C1)
3(c)	0.19 (N / cm ²)	A3
	($P =$) $8.5 \div 44$	(C2)
	($P =$) $F \div A$ in any form	(C1)

Question	Answer	Marks
4(a)(i)	any three from: (particles are) fixed in position / place - regular arrangement - vibrating - close(r than in liquids or gases)	B3
4(a)(ii)	(kinetic energy) decreases	B1
4(b)(i)	absolute zero	B1
4(b)(ii)	–273 °C OR 0 K OR zero K / kelvin	B1
4(c)	black OR dark (colour)	B1
	dull OR rough (surface)	B1

Question	Answer	Marks
5(a)(i)	610 (m)	A3
	$340 = \text{distance} \div 1.8$ OR (distance =) 340×1.8	(C2)
	speed = distance $\div$ time in any form	(C1)
5(a)(ii)	an echo OR sound (waves) reflecting	B1
	from rocks OR YZ OR Z OR bottom of quarry	B1
5(b)	1200 (Hz)	A3
	$340 = f \times 0.28$ OR ($f =$) $340 \div 0.28$	(C2)
	$v = f \lambda$ in any form OR ($f =$) $v \div \lambda$	(C1)

Question	Answer	Marks
6(a)(i)	refraction	B1
6(a)(ii)	any two from: - wavelength - speed - direction	B2
6(b)	total internal reflection	B1
	(red light) travelling from more dense OR into / towards less dense (medium)	B1
	incident on surface at an angle / angle of incidence greater than critical angle	B1

Question	Answer	Marks
7(a)(i)	(nails or magnetic material or it) becomes magnetised OR is a magnet	B1
	(nails or magnetic material or it touching magnet has) the opposite pole to the pole on magnet	B1
7(a)(ii)	steel nails retain magnetism OR are magnetic	B1
7(b)(i)	no OR zero reading on voltmeter	B1
7(b)(ii)	(as conductor / wire) is cutting / linking with magnetic field (of magnet)	B1

Question	Answer	Marks
8(a)	ammeter symbol correct	B1
	voltmeter symbol correct	B1
8(b)	$(R =) 5.7 (\Omega)$	A3
	$(R =) 8(.0) \div 1.4$	(C2)
	$V = IR$ in any form OR $(R =) V \div I$	(C1)
8(c)	$(E =) 340 (\text{J})$	A3
	$(E =) 8(.0) \times 1.4 \times 30$	(C2)
	$(E =) V I t$	(C1)

Question	Answer	Marks
9(a)	(switch is in) the live wire	B1
	(so when switch is off, desktop is) disconnected from supply / mains(voltage) OR high voltage	B1
	(so) no current (in computer / circuit) OR no risk of electrocution	B1
9(b)(i)	step-down (transformer)	B1
9(b)(ii)	any four from: • (soft) iron core • two coils of copper wire • primary coil AND secondary coil • transformer equation stated • <u>turns</u> ratio of 20 : 1 OR 240 : 12 owtte OR use of transformer equation	B4

Question	Answer	Marks
10(a)(i)	53	B1
10(a)(ii)	(131 – 53 =) 78	B1
10(b)	(negatively charged) electron	B1
	electromagnetic (wave / ray)	B1
10(c)	0.2(0) (mg)	A3
	$1.6 \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ OR $1.6 \div 8$ OR 1.6, 0.8, 0.4	(C2)
	$24(.0) \div 8(.0)$ OR idea of 3 half-lives	(C1)

Question	Answer	Marks
11(a)	Mercury Venus Earth Mars	
	3 correct planets	M1
	in correct order	A1
11(b)	any four from: • dust and gas (clouds orbit the Sun) • contain many different elements • rotation of material (around Sun) • (leads to) particles accrete / combine / join • (subsequently) forming larger rocks / boulders • (because of) gravitational attraction • material moves to form (protoplanetary) disks (orbiting Sun) • (continued collisions lead to) formation of planetary core	B4