

Cambridge IGCSE™

PHYSICS	0625/31
Paper 3 Core Theory	
MARK SCHEME	October/November 2021
Maximum Mark: 80	

Published

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Question	Answer	Marks
1(a)	1.6 (cm) OR 14.8 (cm) seen OR used	C1
	13.2 (cm)	A1
1(b)(i)	(top pan / chemical / beam) balance	B1
1(b)(ii)	22 (cm ³) OR 18 (cm ³) seen OR used	C1
	4(.0) (cm ³)	A1
1(c)	(density =) mass ÷ volume OR (d =) m ÷ v in any form	C1
	93.6 ÷ 12	C1
	7.8 (g / cm ³)	A1

Question	Answer	Marks
2(a)(i)	6.14 (s) AND 6.28 (s)	B1
2(a)(ii)	(6.14 + 6.28) ÷ 2 OR 12.42 ÷ 2	C1
	6.21 (s)	A1
2(a)(iii)	idea of decreasing (angle of) slope OR less steep OR smaller gradient	B1
2(b)	(average speed =)(total) distance ÷ (total) time in any form	C1
	1.2 ÷ 7.8	C1
	0.15 (m / s)	A1

Question	Answer	Marks
2(c)	distance = area under graph OR $\frac{1}{2} \times \text{base} \times \text{height}$	C1
	$4.0 \times 1.6 \times 0.5$	C1
	3.2 (m)	A1

Question	Answer	Marks
3(a)	any three from: line drawn alongside cotton thread / string hang triangle from a different corner (B or C) repeat marking of string (position on the card) centre of mass is where lines intersect	B3
3(b)	(moment of weight =) weight $\times$ distance (of direction of force from pivot)	C1
	(moment =) 1.4×20	C1
	28 (N cm)	A1

Question	Answer	Marks
4(a)	horizontal section at 20 °C	B1
	line starting at (0, 50) line decreasing (steadily) (from (0, 50)) to 20 °C in 30 minutes (by eye) line decreasing from 20 °C AND line reaches 5 °C at time of 80 mins	B3
4(b)	any two from: (in solid state molecules / they are) close(r)(than in liquids / gases) (in solid state molecules / they are) in regular arrangement (in solid state molecules / they are) in fixed positions (in solid state molecules / they can only) vibrate	B2

Question	Answer	Marks
5(a)	$(P =) F \div A$ OR (pressure =) force $\div$ area in any form	C1
	$12 \div 25$	C1
	0.48 (N / cm ²)	A1
5(b)	Any four from: molecules in air moving at high speed / kinetic energy molecules collide with (plastic) bottle OR wall (of bottle) force of collisions (per unit area) cause pressure fewer air molecules or collisions on inside(compared to outside) (and so) greater force OR pressure on outside (than inside)	B4

Question	Answer	Marks
6(a)(i)	R	B1
6(a)(ii)	P	B1
6(a)(iii)	idea of: number of (complete) waves {sent out or produced or passing a point} {in one second or unit time}	B1
6(b)	any four from: (student A) bangs two blocks of wood together (student B) starts stopwatch when (sees) blocks or wood collide (student B) stops stopwatch when she hears echo repeat (experiment) AND calculate average (time) uses 240 m as distance travelled by sound owtte use $s = d \div t$	B4

Question	Answer	Marks
7(a)(i)	ray drawn refracted away from normal	B1
7(a)(ii)	angle of incidence correctly identified	B1
7(a)(iii)	angle of refraction correctly identified	B1
7(b)	total internal reflection (at flat surface)	B1
	angle (of incidence) is greater than the critical angle	B1
7(c)(i)	(The speed of visible light is) same (as) (the speed of X-rays.)	B1
	(The frequency of visible light is) lower OR smaller (than the frequency of X-rays)	B1
7(c)(ii)	example of medical / security imaging or treatment of cancer	B1

Question	Answer	Marks
8(a)(i)	N marked on left AND S on the right of magnet	B1
8(a)(ii)	(soft-iron / bar / it) is attracted to the (N pole of the) magnet	B1
	(soft-iron / bar / it) becomes induced magnet	B1
	with opposite pole nearest to magnet	B1
8(b)(i)	electrons move	M1
	from the rod OR to the cloth	A1
8(b)(ii)	TWO electrical conductors named	B1

Question	Answer	Marks
9(a)(i)	voltmeter	B1
9(a)(ii)	volts	B1
9(b)(i)	$(R=) V \div I$ or $V = I \times R$ or in any form	C1
	$6.4 \div 0.2$	C1
	32 (Ω)	A1
9(b)(ii)	increase the length (of the wire using the same thickness)	B1
	smaller diameter (of wire using the same length)	B1

Question	Answer	Marks
10(a)(i)	connect (both ends of) wire to galvanometer	B1
	move wire relative to magnet owtte	B1
10(a)(ii)	any two from: increase strength of magnet(ic field) OR strong(er) magnet turn wire into a coil owtte increase the speed (of relative motion)	B2
10(b)(i)	arrow drawn from N to S on Fig. 10.1	B1
10(b)(ii)	any two from: increase (battery) voltage OR larger current in coil increase strength of magnet(ic field) OR strong(er) magnet increase number of turns in coil	B2
10(b)(iii)	reverse polarity of battery owtte OR reverse magnet(ic field) owtte	B1

Question	Answer				Marks
11(a)		property	type of radiation		B3
			α -particles	β -particles	
		largest mass	✓		
		most ionising	✓		
		most penetrating			
		negatively charged		✓	
		greatest speed			
11(b)	idea of 3 half-lives OR $45 \div 15$				C1
	$80 \div 8$ OR $80 \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$				C1
	10 (mg)				A1