

Cambridge IGCSE™

PHYSICS	0625/32
Paper 3 Core Theory	
MARK SCHEME	May/June 2021
Maximum Mark: 80	

Published

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Question	Answer	Marks
1(a)	(average thickness =) total thickness $\div$ number of sheets	C1
	(average thickness =) $50 \div 200$	C1
	0.25 (mm)	A1
1(b)	density = mass $\div$ volume OR (volume =) mass $\div$ density	C1
	(volume =) $1377 \div 7.65$	C1
	180 (cm ³)	A1
1(c)	(top pan or chemical) balance	B1

Question	Answer	Marks
2(a)(i)	any indication on graph or in working of vertical line from 5.0 s	C1
	22.5 (m/s)	A1
2(a)(ii)	35 (m/s)	B1
2(b)	(speed of car) decreasing OR slows (down)	B1
	(until speed of car) is zero OR stops (moving)	B1
2(c)	(distance =) area under graph OR (distance =) speed $\times$ time	C1
	20×35	C1
	700 (m)	A1

Question	Answer	Marks
2(d)	(average speed =) (total) distance ÷ (total) time	C1
	$226 \div 30(.0)$	C1
	7.53 (m/s)	A1

Question	Answer	Marks
3(a)	(moment of weight =) weight $\times$ (perpendicular) distance (of weight from pivot)	C1
	(moment of weight =) 150×1.8	C1
	270	A1
	N m	B1
3(b)	barrier no longer balanced OR cannot be lowered (easily)	B1
	(more) force needed to lower barrier	B1
	(because) moment of heavy weight (has) increased	B1

Question	Answer	Marks
4(a)	any four from: • (gravitational) potential energy (of ball) • (is) transformed/transferred to OR becomes kinetic energy (of ball) • as it falls or moves <u>down slope</u> must be linked to energy (change) • kinetic energy transferred to (gravitational) potential energy • (as) ball rises or moves <u>up slope</u> must be linked to energy (change) • (transferred to) thermal energy (due to friction)	B4

Question	Answer	Marks
4(b)	any two from: • some (of the initial) (G)PE/energy is transferred • (to) thermal energy • (due to) friction/air resistance • ball has less (G)PE/energy at stopping point	B2

Question	Answer	Marks
5(a)(i)	(mercury) manometer	B1
5(a)(ii)	(pressure of gas in cylinder) is 14 cm of mercury (different to atmospheric pressure) owtte	C1
	(75 + 14 =) 89 (cm of mercury)	A1
5(b)	vertical tile (is more likely to sink)	B1
	any three from: • (because) tiles have same weight • pressure = force ÷ area • small(er) area (in contact with ground) for vertical tile ora • (so) greater/big pressure (exerted on ground) ora	B3

Question	Answer	Marks
6(a)(i)	32 (°C)	B1
6(a)(ii)1	to enable rapid transfer of thermal energy to liquid in bulb	B1
6(a)(ii)2	idea: (small change in volume OR temperature) produces large movement of mercury along capillary owtte	B1

Question	Answer	Marks
6(b)	any four from: - line starting at 40 °C - line showing decreasing temp with time for 40 minutes - line becoming horizontal at –12 °C - horizontal line for about 20 mins (by eye) - line showing decreasing temp after horizontal section	B4

Question	Answer	Marks
7(a)(i)	(1st box/next to visible) ultraviolet (rays)	B1
	(2nd box/next to gamma) X-rays	B1
7(a)(ii)	detection and treatment of cancer OR imaging/gamma photography OR (space) telescopes OR sterilisation of food/medical equipment	B1
7(a)(iii)	statement: (radiations arrive) at same time	M1
	reason: (because they have) same speed (in a vacuum)	A1
7(b)(i)	use of peaks to find time interval	C1
	0.2 (s)	A1
7(b)(ii)	frequency = number of pulses per s	C1
	5 (Hz)	A1

Question	Answer	Marks
8(a)(i)	normal drawn at X correct by eye	B1
8(a)(ii)	angle of refraction correctly labelled	B1

Question	Answer	Marks
8(a)(iii)	any one from: - pin(s) OR ray box OR (low voltage) power supply OR - protractor OR ruler	B1
8(b)	ray reflected from flat surface	M1
	ray reflected with angle i = angle r	A1

Question	Answer	Marks
9(a)(i)	electron(s)	B1
9(a)(ii)	(component X is a) <u>variable</u> resistor	B1
9(a)(iii)	$V = IR$ or $(R =) V/I$	C1
	$5.5 \div 0.05$ (0)	C1
	110 (Ω)	A1
9(b)	(current in circuit) increases	B1
	(because) resistance of LDR decreases	B1

Question	Answer	Marks
10(a)(i)	in any order:	
	increase current (in coil)	B1
	increase strength of magnet(s) or magnetic field(s)	B1
	increase the number of turns on the coil	B1

Question	Answer	Marks
10(a)(ii)	(direction of the) current (in the coil) is reversed	B1
10(b)	$(V_p/V_s) = (N_p/N_s)$ in any form	C1
	$234 \div 18 = 2470 \div N_s$ OR $N_s = 2470 \div (234 \div 18)$ OR $2470 \div 13$	C1
	(turns on secondary/output coil $N_s =$) 190	A1

Question	Answer	Marks
11(a)	line from A to middle box: nucleon number	B1
	line from Z to bottom box: proton number	B1
11(b)(i)	(from June 2004 to June 2014 =) 10 (years)	B1
	(decrease in activity from) 80 000 (Bq) to 20 000 (Bq) takes 2 half-lives	B1
	$10 \div 2 =$ (5 years)	B1
11(b)(ii)	(decrease in activity from) 20 000 (Bq) to 10 000 (Bq) is one half-life	C1
	so half the time difference = 5 years OR 2019	A1