



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 **12** printed pages.

Question	Answer	Marks
1(a)	(measurement) time (instrument used) stopwatch	B1
	(measurement) distance (instrument used) metre rule(r)	B1
1(b)(i)	12.5 (cm/s)	A2
	any indication on graph or in working of vertical line from 2.0 s	(C1)
1(b)(ii)	50 (cm)	A3
	$\frac{1}{2} \times 4 \times 25$	(C2)
	(distance =) area under graph OR (distance =) speed $\times$ time	(C1)
1(b)(iii)	accelerating (for 4 seconds)	B1
	(then) constant / steady speed (for 6 seconds)	B1

Question	Answer	Marks
2(a)	0.11 (mm)	A3
	(average thickness =) $29 \div 270$	(C2)
	(average thickness =) total thickness $\div$ number of sheets	(C1)
2(b)	(1300 g =) 1.3 kg	(B1)
	(weight =) 13(.0) N	A3
	(weight =) mass $\times$ g OR mass $\times$ 10	(C1)

Question	Answer	Marks
3(a)(i)	4000 (N)	A2
	(resultant force =) force to R – force to L OR 12000 – 8000	(C1)
	(to the) left or forwards	B1
3(a)(ii)	air resistance	B1
3(a)(iii)	constant/steady speed	B1
3(b)	1200 (Ncm)	A3
	(moment of force =) 60×20	(C2)
	(moment of force =) force $\times$ (perpendicular) distance of force from pivot	(C1)

Question	Answer	Marks
4(a)(i)	(X is a) turbine	B1
	(Y is a) generator	B1
4(a)(ii)	any two from: chemical energy (in coal) to thermal/internal energy (in boiler) thermal/internal energy (of steam/water) to kinetic energy (of steam) kinetic energy of steam to kinetic energy of turbine/generator kinetic energy (of generator) to electrical energy	B2
4(b)	200 000 (V)	A3
	$V_s / 25000 = 4800/600$ OR $V_s = (4800/600) \times 25000$ OR $V_s = 25000 \times 8$ OR $4800/600 = ? / 25000$	(C2)
	$V_s/V_p = N_s/N_p$ in any form	(C1)

Question	Answer	Marks
4(c)	any two from: reduces current (in cables) less energy or power wasted or less heating or more efficient enables use of thinner cables (so) lower cost for cable and supporting pylons transmit (electricity over) longer distances (without drop in p.d.)	B2

Question	Answer	Marks
5(a)(i)	(shiny surfaces) are <u>good</u> reflectors OR <u>poor</u> absorbers/emitters	B1
	so less thermal energy lost by radiation	B1
5(a)(ii)	less (heat lost by) convection	B1
	less (heat lost by) conduction	B1
5(b)	more energetic particles	B1
	particles escape (from the surface (attraction))	B1
	so average energy of particles remaining (in liquid) decreases	B1
5(c)(i)	Brownian (motion)	B1
5(c)(ii)	any two from: (fast moving liquid) molecules bombard/collide with (small) particle collisions produce (resultant) force (in random directions)	B2

Question	Answer	Marks
6(a)(i)	(1st box) microwaves	B1
	(2nd box) infrared	B1
6(a)(ii)	X-rays OR gamma rays	B1
6(b)	horizontal line drawn between 2 peaks OR any 2 adjacent similar points on the wave	B1
6(c)	microwaves	B1
	X-rays	B1
6(d)	longitudinal (vibrations) are parallel to the direction of propagation	B1
	transverse (vibrations) are perpendicular/at right angles to the direction of propagation	B1

Question	Answer	Marks
7(a)(i)	29(°)	B1
7(a)(ii)	normal (line)	B1
7(b)(i)	ray through centre continues in straight line	B1
	(ray through F) drawn parallel to principal axis	B1
7(b)(ii)	arrow drawn from principal axis to where rays cross	B1

Question	Answer	Marks
8(a)(i)	plastic strip AND glass lens	B1
8(a)(ii)	iron bar	B1

Question	Answer	Marks
8(b)	end of magnet X labelled S (pole) AND end of magnet Y nearest magnet X labelled N (pole) AND other end is S (pole)	B1
8(c)(i)	spheres drawn closer together	B1
8(c)(ii)	spheres drawn further apart	M1
	both strings at an angle to vertical	A1

Question	Answer	Marks
9(a)	correct symbol for battery	B1
	correct symbol for switch	B1
	correct symbol for lamp	B1
	all 3 components connected in series	B1
9(b)(i)	0.26 (A)	B1
9(b)(ii)	5.4 (Ω)	A3
	$1.4 \div 0.26$	(C2)
	$V = IR$ or $(R =) V/I$	(C1)

Question	Answer	Marks
10(a)	circles drawn	B1
	concentric (by eye) with wire	B1
	arrow drawn clockwise on/near field (line)	B1
10(b)(i)	any two from: increase current (in wire) increase strength of magnets or magnetic field move poles closer together	B2
10(b)(ii)	reverse the (direction of the) current (in the wire)	B1
	reverse the magnetic field	B1

Question	Answer	Marks
11(a)	${}_{95}^{241}\text{Am}$	B1
		B1
11(b)	430 (years)	A2
	(decrease in activity from) 16 000 (counts/min) to 8000 (counts/min)	(C1)