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PHYSICS

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Paper 3 Core Theory

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MARK SCHEME

Maximum Mark: 80

Published

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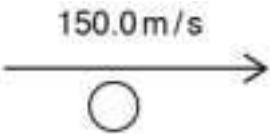
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Question	Answer	Marks
1(a)	72 (s)	1
1(b)	(average speed =) distance ÷ time	1
	120 ÷ 54	1
	2.2(2) (m / s)	1
1(c)	area under line OR three areas indicated OR (dist =) (av.) speed × time OR $\frac{1}{2} (b + h) \times L$	1
	$\frac{1}{2} \times 3.5 \times 4.0$ OR 7 (m) seen OR 6×3.5 OR 21 (m)	1
	6×3.5 OR 21 (m) AND $\{\frac{1}{2} \times 3.5 \times 4.0$ OR 7 (m) $\}$ OR 14 (m)	1
	(21 + 14 =) 35 (m)	1

Question	Answer	Marks
2(a)(i)	measure mass of empty measuring cylinder/beaker add measured/fixed volume of liquid measure mass of measuring cylinder/beaker and liquid determine mass of liquid (by subtracting mass empty from mass when full) use of $D = M/V$	5
2(a)(ii)	g / cm^3 OR kg / m^3	1
2(b)(i)	(polythene is) less dense (than water)	1
2(b)(ii)	$W = m \times g$ in any form OR $(m =) W \div g$ OR 100 g weighs 1 N	1
	$0.84 \div 10$ OR $100 \text{ (g)} \times 0.84$	1
	0.084 (kg) OR 84 g	1

Question	Answer	Marks
3(a)	$43.0 + 2.4 = 45.4 \text{ (N)}$	1
	$(74.2 - 45.4 =) 28.8 \text{ (N)}$	1
	upwards	1
3(b)		1

Question	Answer	Marks
4(a)	Any four from: specs/dots (of light) (smoke/air particles) moving (smoke/air particles) randomly (because fast moving) air molecules collide with smoke particles (producing)Brownian motion	4
4(b)	evaporate/evaporation	1
	high(er) energy/enough energy/fast(er) moving molecules OR molecules with great(er) KE	1
	escape (from the water surface)	1

Question	Answer	Marks
5(a)	Q S P R	3
5(b)	any one advantage from: continuous supply/steady supply or reverse argument any one disadvantage from: only available in certain areas/thin crust/near geysers or can damage water table OR limited lifespan/rocks can cool	2

Question	Answer	Marks
6(a)	$(26 - 23 =) 3(^{\circ}\text{C})$	1
6(b)	any three from: use metal pipe paint black or use black pipe use matt or dull (paint) (place) reflector behind pipe use long(er) pipe use pipe with great(er) surface area slow(er) flow rate (place) glass/(clear) plastic cover over pipe	3
6(c)	infra-red (radiation through space/air)	1
	conduction <u>through pipe</u>	1

Question	Answer	Marks
7(a)(i)	blue between indigo and green	1
	yellow between green and orange	1
7(a)(ii)	arrow pointing right $\longrightarrow$	1
7(b)(i)	ray(s) refracted down at first boundary (air/glass)	1
	correct refraction for candidate's ray (in glass prism)	1
7(b)(ii)	refraction	1

Question	Answer	Marks
8(a)(i)	tape measure	1
8(a)(ii)	reflection (of sound)	1
8(b)	time for sound to travel to wall and back = 1.0 s	1
	340 m in 1.0 s	1
	(speed =) 340	1
	m / s	1

Question	Answer	Marks
9(a)(i)	X-rays between gamma rays and ultraviolet	1
	microwaves between infra-red and radio	1
9(a)(ii)	ring drawn around radio on Fig.9.1	1
9(b)	any two from: lead/metal apron (use long) tongs limit (time of) exposure point source away (from you) owtte	2

Question	Answer	Marks
10(a)	resistor identified	1
10(b)	quantity current NOT amps ignore ammeter	unit A/amps/amperes
	quantity potential difference or p.d. or emf	unit V/volts ignore voltmeter
10(c)	increasing (length) increases resistance owtte	1
	increasing (diameter) decreases resistance owtte	1

Question	Answer	Marks
11(a)(i)	cell and switch connected in series with any part of conductor (on Fig.11.1)	1
	correct symbols used – (on Fig.11.1)	1
11(a)(ii)	circular	1
	around conductor/wire	1
11(a)(iii)	no change/nothing	1
11(b)	conductor/wire between the poles of a magnet	1
	opposite poles facing each other	1
	current in wire	1
	wire moves/Flemings left hand rule indicated	1

Question	Answer	Marks
12(a)(i)	α or alpha	1
12(a)(ii)	α or alpha	1
12(b)(i)	beta or β	1
	beta emission would be affected by the thickness of the metal owtte	1
12(b)(ii)	(counter) reading higher	1
12(b)(iii)	rollers move apart/provide less force/pressure owtte	1
12(b)(iv)	38	1