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Cambridge International General Certificate of Secondary Education

PHYSICS

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Paper 3 Core Theory

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MARK SCHEME

Maximum Mark: 80

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This document consists of **11** printed pages.



Question	Answer	Marks
1(a)(i)	balance	B1
1(a)(ii)	density = mass ÷ volume in any form	C1
	$1260 \div 150$	C1
	8.4	A1
	g / cm ³	B1
1(a)(iii)	1.26 (kg)	B1
1(b)	W = mg in any form	C1
	0.25×10	C1
	2.5 (N)	A1
	Both lines have 2.5 (N)	B1

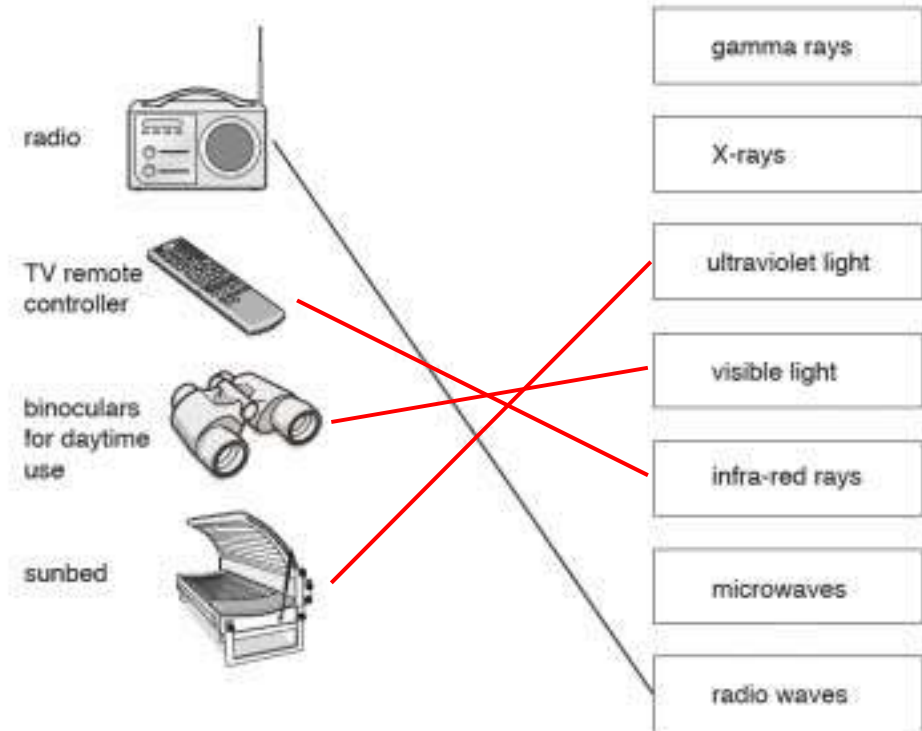
Question	Answer	Marks
2(a)	<u>moment</u>	B1
2(b)(i)	(sum of) clockwise moment(s) = (sum of) anticlockwise moment(s)	C1
	$1.2 \times 400 = 0.3 \times F$	C1
	1600 (N)	A1
2(b)(ii)	use a longer lever OR pivot closer to log / force F	B1

Question	Answer	Marks
3(a)	67 (cm)	C1
	$(67 \div 5 =) 13.4$ (cm)	A1
3(b)	C 1st ; A 2nd;	B1
	D 4th; E 5th	B1
3(c)	speed = distance $\div$ time in any form OR $(t =)$ distance $\div$ speed	C1
	$11 \div 16$	C1
	0.69 (s)	A1

Question	Answer	Marks
4(a)(i)	Pressure = force $\div$ area in any form	C1
	$50 \div 1.8$	C1
	28 (N / cm ²)	A1
4(a)(ii)	In range 13 500 to 15 000 (N / cm ²)	B1
4(b)(i)	(mercury) <u>barometer</u>	B1
4(b)(ii)	vacuum OR nothing	B1
4(b)(iii)	a value less than 760 mm (Hg) and > 0 mm (Hg)	B1

Question	Answer	Marks
5(a)(i)	It will be used up / cannot be replaced (easily) owtte	B1
5(a)(ii)	nuclear AND oil	B1
5(b)	Advantages– any two from easy to store less atmospheric pollution than other fossil fuels cheaper than other fossil fuels concentrated energy source large reserves can respond to demand reliable Disadvantages – any two from (produces / releases) carbon dioxide (waste gases produce) acid rain (waste gases produced) contribute to global warming non-renewable danger of explosion danger of carbon monoxide poisoning long pipelines needed (from some gas fields)	B4

Question	Answer	Marks
6(a)	0 AND 100 correctly labelled	M1
	36	A1
6(b)(i)	<u>Melting</u>	B1
	Any one of: molecules gain energy molecule (begin to) break (some) bonds arrangement becomes irregular or arrangement changes	B1
6(b)(ii)	<u>boiling</u>	B1
	Any one of: molecules break (all) bonds molecules move (more) freely molecules become widely separated or far apart	B1

Question	Answer	Marks
7(a)		B1
		B1
		B1
7(b)(i)	infrared OR microwaves OR radio waves	B1
7(b)(ii)	speed	B1

Question	Answer	Marks
8(a)(i)	electrons in 1st space	B1
	cloth in 2nd space	B1
8(a)(ii)	<u>negative</u>	B1
8(a)(iii)	like charges repel (each other)	B1
8(b)(i)	ring around copper	B1
8(b)(ii)	(earth wire must be good electrical) conductor	B1

Question	Answer	Marks
9(a)	(position) R	B1
9(b)	$V = IR$ in any form	C1
	$(R =) 6.0 \div 0.5$ OR $6.0 = 0.5 \times R$	C1
	$(R =) 12$	A1
	Ω or ohms	B1
9(c)	both lamps have correct p.d. OR voltage (across them)	B1
	if one lamp fails the other is still lit	B1

Question	Answer	Marks
10(a)	thermistor	B1
10(b)(i)	low (brightness) OR off	M1
	pd or voltage (across lamp) is zero or almost zero	A1
10(b)(ii)	(brightness / it) increases	B1
	p.d. / voltage (across lamp) increases	B1
10(b)(iii)	lamp blows / fuses (when p.d. too high)	B1

Question	Answer	Marks
11(a)	(diagram) A	B1
11(b)(i)	connect coil to (centre zero) meter	B1
	move magnet in OR / AND out of coil	B1
	(observe) deflection on meter	B1
11(b)(ii)	any two from: use stronger magnet move magnet faster more turns on coil OR use more than 100 turns	B2
11(c)	(generator produces) alternating current OR direction of current keeps changing	B1

Question	Answer	Marks
12(a)	positive	B1
	positive	B1
	negative	B1
12(b)(i)	88	B1
12(b)(ii)	138	B1
12(b)(iii)	$^{223}_{88}\text{Ra}$	B1
12(c)	3 half lives (until 1.0 mg remains)	C1
	$(3 \times 1600) = 4800$ (years)	A1