

Revision Sheet

Pearson Edexcel · International A-Level · Physics · Unit 2 Waves and Electricity

18 vocabulary items · 23 marks of exam questions (4 questions)

Part 1 · Vocabulary review answer key. Section A wants the exact English spelling.

Question	Answer	Marks
1	Waves	1
2	frequency	1
3	wavelength	1
4	Phase	1
5	standing wave	1
6	tension	1
7	mass per unit length	1
8	Intensity	1
9	refractive index	1
10	Diffraction	1
11	diffraction grating	1
12	de Broglie wavelength	1
13	Photons	1
14	photoelectric effect	1
15	Current	1
16	Potential difference	1
17	Resistivity	1
18	Internal resistance	1

Multiple Choice Answers

Q19: C

Multiple Choice Answers

Q20: C

21(a)	Use of $v = \frac{s}{t}$ (1) Halves distance or doubles time (1) Distance = 28 m (1) <u>Example of calculation</u> $s = 1500 \text{ m s}^{-1} \times 37 \times 10^{-3} \text{ s} = 55.5 \text{ m}$ $\frac{55.5 \text{ m}}{2} = 27.8 \text{ m}$	3
21(b)	An echo must return to the transducer before the next pulse is transmitted (1) Or T (should be) $>$ time for the echo to return (1) So if T increases, the maximum distance increases (1)	2
21(c)	Higher frequency sound waves lead to smaller wavelength (1) This gives better resolution (dependent on MP1) (1) Or Higher frequency sound waves will diffract less	2
Total for question 21		7

22(a)(i)	The resistance of a sample of the material of unit <u>cross sectional area</u> and unit length Or $\rho = \frac{RA}{l}$ with terms defined	(1)	1
22(a)(ii)	Measure the L using a metre rule Measure the thickness of the material using a micrometer Or Measure the thickness of the material using vernier callipers Use an ammeter and voltmeter to determine the resistance using $R = \frac{V}{I}$ Or Use an ohmmeter to measure the resistance of the sample Use $\rho = \frac{RA}{l}$ to determine the resistivity Or valid description of a graph and gradient calculation to determine the resistivity	(1) (1) (1) (1)	4
22(b)	Copper has a high concentration of charge carriers $I = nAvq$ so (for a given current) drift velocity is small	(1) (1)	2
22(c)	The same potential difference is applied across each additional panel So each panel dissipates the same power, and power output of the system increases OR As more panels are connected, the resistance (of the system) decreases (and potential difference remains the same) And $P = \frac{V^2}{R}$ so power output of the system increases OR As more panels are connected, the current in the power supply increases (and potential difference across each panel is the same) And $P = VI$ so power output of the system increases OR As more panels are connected, the current in the power supply increases and the resistance of the system decreases by the same factor And $P = I^2R$ so power output of the system increases	(1) (1) (1) (1) (1) (1) (1) (1)	2

22(d)	Use of $A = \text{length} \times \text{thickness}$ (1) Use of $\rho = \frac{RA}{l}$ (1) Use of $R_{\text{total}} = \frac{R_{1 \text{ panel}}}{5}$ (1) Use of $P = \frac{V^2}{R}$ (1) 680 W is greater than 350 W so the system is not safe (1) OR Use of $A = \text{length} \times \text{thickness}$ (1) Use of $\rho = \frac{RA}{l}$ (1) Use of $P = \frac{V^2}{R}$ (1) Use of $P_{\text{total}} = 5 \times P_{1 \text{ panel}}$ (1) 680 W is greater than 350 W so the system is not safe (1) <u>Example of calculation</u> $A = 1.60 \text{ m} \times 0.48 \times 10^{-3} \text{ m} = 7.68 \times 10^{-4} \text{ m}^2$ $R = \frac{6.4 \times 10^{-3} \Omega \text{ m} \times 0.51 \text{ m}}{7.68 \times 10^{-4} \text{ m}^2} = 4.25 \Omega$ $R_{\text{total}} = \frac{4.25 \Omega}{5} = 0.85 \Omega$ $P = \frac{(24 \text{ V})^2}{0.85 \Omega} = 678 \text{ W}$	5
Total for question 22		14