Practice Question Set For A-Level
Subject : Physics
Paper-1 Topic: Waves

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Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

(a) A wave transfers energy from one point to another ✔
without transferring material / (causing permanent displacement of the medium) ✔ owtte

2

(b) (i) 0.6 (mm) or 0.60 (mm) ✔

1

(ii) 0.080 (m) ✔
Allow 1 sig fig

1

(iii) $f = 1/T = 1/0.044 = 23$ (Hz) ✔ (22.7 Hz)

1

(iv) $v = f\lambda = 22.7 \times 0.080 = 1.8$ (m s^{-1}) ✔ (1.82 m s^{-1})
allow CE v = (biii) × (bii) but working must be shown
1 sig fig not acceptable

1

(c)

sound waves are transverse	sound waves are longitudinal	sound waves can interfere	sound waves can be polarised
	√	√	

1

(d) the wavelength would be smaller
smaller spread in main peak or more peaks (between A and B)
the central peak is higher (owtte)
as the energy is concentrated over a smaller area (owtte)
reference to ($\sin\theta_{min} = \lambda/d$)
✔ ✔ ✔ any 3 lines max 3
Note that the marks here are for use of knowledge rather than performing calculations.
No bod if writing does not make increase or decrease clearly distinct.
Marking should be lenient.

3

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Q2.

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(a) Answer D ✔ (violet)

1

(b) (light from each slit) superpose
light from adjacent slits have a path difference of one wavelength
(at this angle all) the waves are in phase
constructive interference / peaks coincide / (positively) reinforce

any 3 points ✔ ✔ ✔ max 3

Ignore reference to nodes or antinodes

If general statements are made only give marks for parts related to 'Bright line' or 'First order' which appears in the question.

3

(c) (i) use of $\sin\theta = \lambda / d = 5.3 \times 10^{-7} / 1.8 \times 10^{-6}$ ✔ (= 0.294)
$\theta = 17°$ ✔ (17.1°)

Answer alone scores both marks

2

(ii) (use of $n = d \sin\theta / \lambda$) $n_{max} = (d \sin 90° / \lambda) = d / \lambda =$ ✔
$= 1.8 \times 10^{-6} / 5.3 \times 10^{-7} = 3.4$ ✔
max order = 3 ✔

Showing that n=4 is not possible is not answering the question but the first mark (equation mark) can be gained this way

Max order is an independent mark from reducing a calculated value for n to the next lowest integer.

3

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