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

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) 6.5×10^{10} Pa ✓

1

(b) $\text{kg m}^{-1} \text{s}^{-2}$ ✓

1

(c) Direction of movement of particles in transverse wave perpendicular to energy propagation direction ✓

1

Parallel for longitudinal ✓

1

(d) $\rho_1 c_1 = \rho_2 c_2$ ✓

$E = \rho c^2$ or $\rho c = \frac{E}{c}$ seen

1

$\left[\frac{E_1}{c_1} = \frac{E_2}{c_2}\right]$

1

(e) $[\frac{\rho_x}{\rho_y} = \frac{c_y}{c_x}$ and $c_x = 2c_y]$

0.5 ✓

1

(f) speed of the wave in seawater is less than speed of the wave in glass ✓

1

argument to show that ${}_{water}n_{glass} < 1$ ✓

1

so tir could be observed when wave moves from water to glass ✓

1

[10]

Q2.

(a) waves are <u>reflected</u> (from the oven wall) ✔

1

and superpose/interfere with wave travelling in opposite direction/incident waves/transmitted wave ✔

NOT superimpose

1

(b) energy/amplitude is maximum ✔

1

(chocolate melts at) antinode ✔

if refer to node can still be awarded first mark

1

(c) clear evidence that used first and third antinode ✔

can be from diagram

1

distance from first to third antinodes = 0.118 ± 0.001 (m) OR distance between two adjacent antinodes = 0.059 ± 0.001(m) ✔

mark for either value

carry their value forward for subsequent marks even if outside tolerance

1

wavelength = 0.118 (m) ✔

mark for using their wavelength (range 0.112 to 0.124)

1

frequency = 3.0×10^8 /0.118 ✔

mark for use of $v = f\lambda$ allow this mark if use 0.059

1

frequency = 2.5×10^9 (Hz) ✔

***must** be in range $2.40 \times 10^9 - 2.60 \times 10^9$*

if use 330 for speed lose last 2 marks

1

(d) position of antinode/maximum energy/maximum amplitude/nodes (in food) continually changes ✔

must be clear antinode maximum energy/maximum amplitude changes location

1

[10]