Practice Question Set For A-Level

Subject: Physics

Paper-1 Topic: Waves



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Name of the Student:

Max. Marks: 24 Marks Time: 24 Minutes

Mark Schemes

Q1.

(a)
$$n_1 > n_2 \checkmark$$

Allow correct reference to 'optical density'

(incident) angle > critical angle (allow θ_c not 'c') **OR** critical angle must be exceeded \checkmark

Allow $n_A > n_B$

Do not allow: 'angle passes the critical angle'

(b)

$$\left(n_s = \frac{c}{c_s}\right)$$

$$\left(c_A = \frac{c}{n_A} = \right) \ \frac{3.00 \times 10^8}{1.80} \ \checkmark$$

For second mark, don't allow 1.6×10^8 Allow 1.66×10^8 or 1.70×10^8 Allow $1.6. \times 10^8$

$$(= 1.667 \times 10^{8}) = 1.67 \times 10^{8} \text{ (ms}^{-1}) \checkmark$$

(c) $\sin 72 = 1.80 \sin \theta \checkmark$ $(\sin \theta = \frac{\sin 72}{1.80} = \frac{0.9510565}{1.8} = 0.52836$)

Correct answer on its own gets both marks

 θ = 31.895 = 31.9 correct answer >= 2sf seen \checkmark Do not allow 31 for second mark

Allow 31.8 - 32

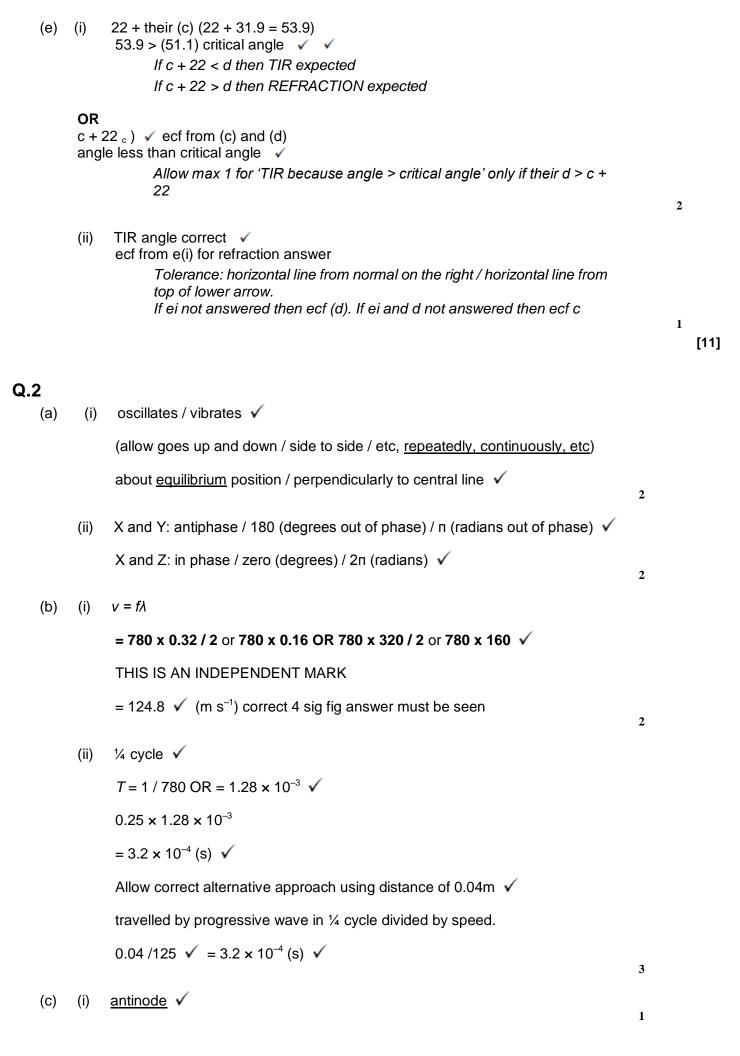
(d) 1.80 $\sin \theta_c = 1.40 \text{ OR}$ $\sin \theta_c = \frac{1.40}{1.80}$ $\theta_c = 51.058 = 51.1$ ° \checkmark (accept 51)

Correct answer on its own gets both marks Don't accept 50 by itself

OR = 0.778

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(ii) 2 x 0.240 = 0.48 m √ '480m' gets 1 mark out of 2

(iii) $(f = v/\lambda = 124.8 \text{ or } 125 / 0.48) = 260 \text{ (Hz) ecf from cii} \checkmark$

[13]