30/10/23

Day 33

$$y = A \sin \omega t$$

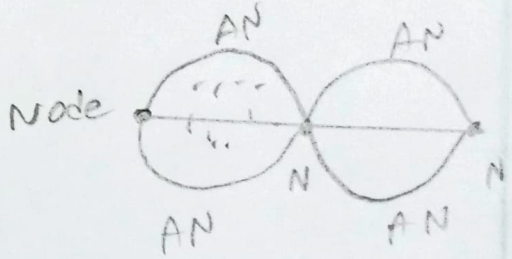
$$\frac{dy}{dt} = A\omega \cos \omega t$$

$$\frac{d^2y}{dt} = A\omega \cdot \omega (-\sin \omega t)$$

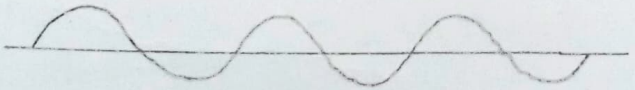
$$= -A\omega^2 \cdot \sin \omega t$$

$$\frac{d^2y}{dt} = \omega^2 y$$

* stationary wave



* Transverse wave

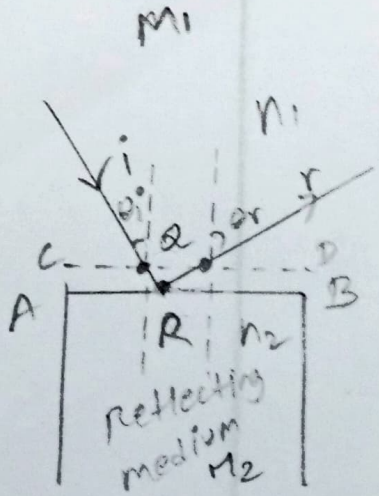


OPTICS

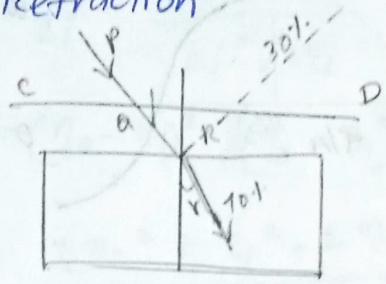
i) Reflection

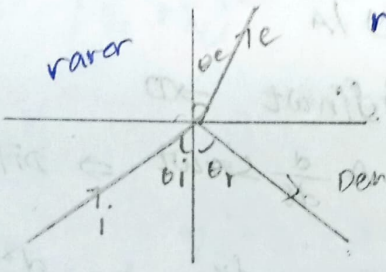
$$n_1 \sin \theta_i = n_2 \sin \theta_r$$

$$\theta_i = \theta_r$$



ii) Refraction





$n_1 \sin\theta_i = n_2 \sin\theta_r$

$\sin\theta_c = \frac{n_2}{n_1}$

$\theta_c = \sin^{-1}\left(\frac{n_2}{n_1}\right)$

iii) Total Internal Reflection

i) $n_1 > n_2$

ii) $\theta_i > \theta_c$