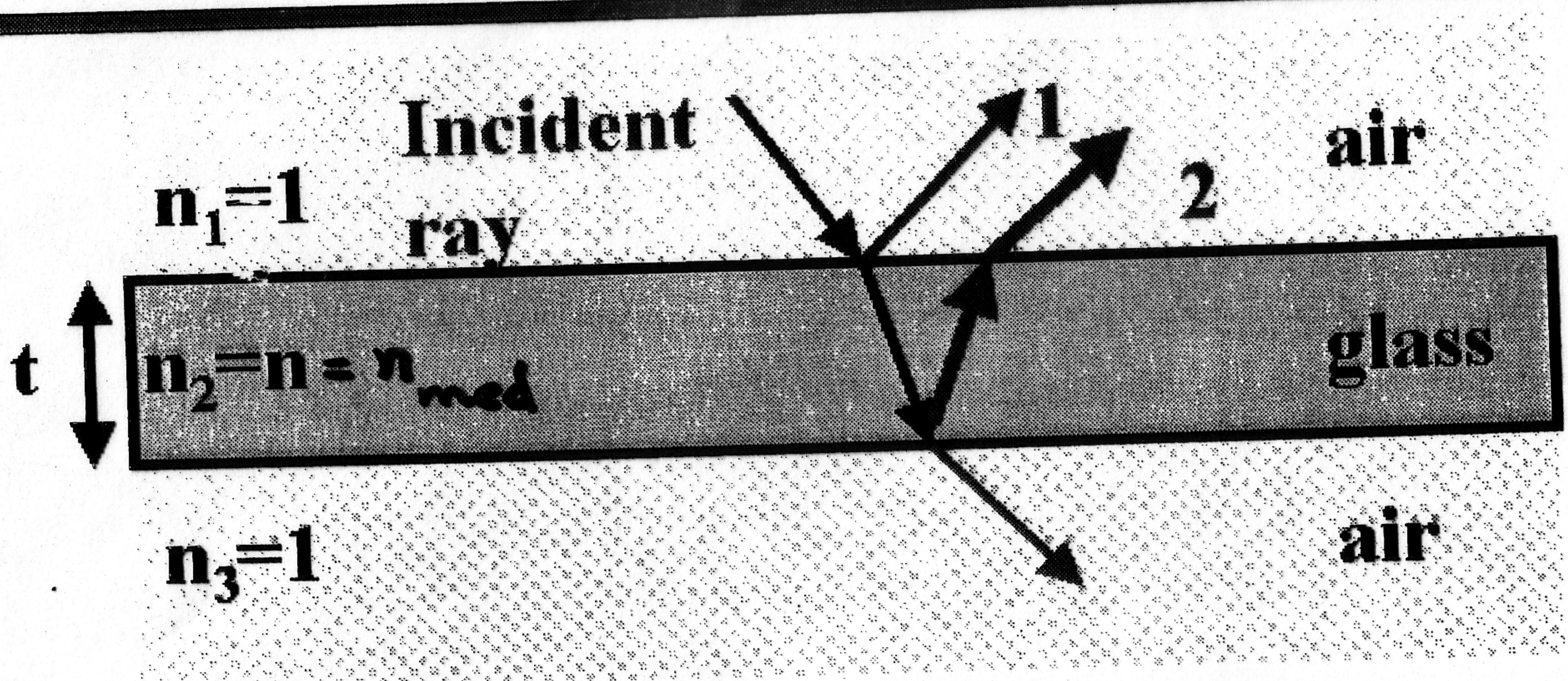


Thin film in air

(18)



$$\frac{\lambda_2}{n_1} = \frac{\lambda_1}{n_2}$$

$$n_1 = 1$$

$$\lambda_2 = \lambda_{med}$$

$$n_2 = n_{med}$$

$$\lambda_1 = \lambda_{air}$$

- Let us consider the situation where $n_1 = n_3 = 1$ and $n_2 = n$
- Ray 1 is reflected at the air glass interface. Since $n_1 < n_2$ the reflected ray will change phase ϕ by π (equivalent to a change in $\lambda_n/2 = \lambda/(2n)$).
- Ray 2 is reflected at the glass-air interface. Since $n_2 > n_3$ then ray does not change of phase ($\phi = 0^\circ$) upon reflection.

$$2t = \left(m + \frac{1}{2}\right) \lambda_{med}$$

Constructive interference

$$\lambda_{med} = \frac{\lambda_{air}}{n_{med}}$$

medium is glass
 $n_{med} = n_2 = n_{glass}$

$$2t = m \lambda_{med}$$

Destructive interference

$$m = 0, 1, 2, \dots$$