

$$I = KA^2$$

or
$$I = K (a_1^2 + a_2^2 + 2a_1a_2 \cos \phi) \quad \dots\dots(8)$$

Condition for Maxima (Constructive Interference)

For, $I = I_{\max}$ i.e. $\phi = 0, \pm 2\pi, \pm 4\pi, \dots = \pm n\pi \dots\dots(9)$ where $n = 0, 1, 2, 3, \dots$

Corresponding value of path difference, $\Delta x = \pm n\lambda = 0, \pm \lambda, \pm 2\lambda, \pm 3\lambda, \dots\dots\dots \dots\dots\dots \dots(10)$

$$I_{\max} = K(a_1 + a_2)^2 \quad \dots\dots(11)$$

Condition for Minima

For getting minima at point P i.e. $I = I_{\min}$

So, by eqn. (8), $\cos \phi' = 1$

$$\phi' = \pm\pi, \pm 3\pi, \pm 5\pi$$

$$\phi' = \pm (2m - 1)\pi \quad \dots\dots(13)$$

where $m = 1, 2, 3, \dots\dots$