

$$A_{\max} = A_1 + A_2 = A + 2A = 3A \quad \text{and}$$

$$A_{\min} = A_1 - A_2 = 2A - A = A$$

$$\frac{I_{\max}}{I_{\min}} = \frac{A_{\max}^2}{A_{\min}^2} = 9$$

## Displacement of Fringes

When a film of thickness 't' and refractive index ' $\mu$ ' is introduced in the path of one of the wavelets, the optical path length of this wavelet become more than its geometrical path length by  $(\mu t - t)$ . So, the value of optical path difference changes at every point on the screen and it causes a shift in the position of every fringe.

Optical path difference at P

$$\Delta x_{\text{optical}} = S_2P - [S_1P + \mu t - t] = S_2P - S_1P - (\mu - 1)t = \frac{yd}{D} - (\mu - 1)t$$

