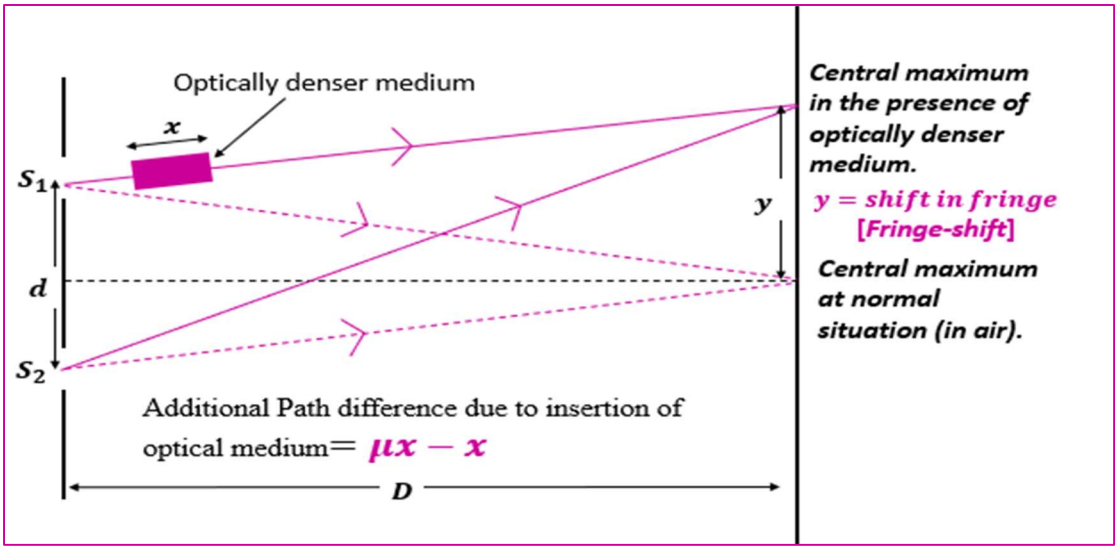
or $\boldsymbol{D = \mu x}$ [*Here,* $\boldsymbol{D = optical\ path}$]

i.e., *For a medium of* $\boldsymbol{refractive\ index\ \mu}$ *and of* $\boldsymbol{thickness\ x}$,

$$Optical\ path = \mu x$$

Note:

- The presence of an optical medium on the path of one slit creates additional path difference and hence affects the position of central maximum (also all other fringes).
  - ✓ The central maximum (also all other fringes) is displaced by same distance.



Working formula:

$$additional\ path\ difference = \frac{d}{D}\ y$$

$$(\mu - 1)\ x = \frac{d}{D}\ y \qquad y = fringe\ shift$$

1. Interference fringes were produced by the young's slits methods, the wavelength of light being $6 \times 10^{-7}\ m$. When a film of material $3.6 \times 10^{-3}\ cm$ thick was placed over one of the slits, the fringes pattern was displaced by a distance equal to 30 times that between two adjacent fringes. Calculate the refractive index of the materials. [Ans: 1.5]