

**Answer on Question #38256 – Physics – Other**

In Young's double slit experiment the separation between the slits is  $d$  and the wavelength of light used is  $6000\text{Å}$ . If the angular width of the interference fringe formed at distant screen is  $1^\circ$  then the value of  $d$  is :

- a)1mm                                      b)0.05mm                                      c)0.03mm                                      d)  
0.01mm

**Solution**

$\lambda = 6000\text{Å} = 6000 \times 10^{-10}\text{m}$  – wavelength;

$\theta = 1^\circ$  – angular width of the interference fringe;

$d$  – separation between the slits;

Angular width,  $\theta = \frac{\lambda}{d} = 1^\circ = 1^\circ \cdot \frac{\pi}{180^\circ}$

$$d = \frac{180^\circ \cdot \lambda}{\pi} = \frac{180^\circ \cdot 6000 \times 10^{-10}\text{m}}{1^\circ \cdot \pi} = 34.3 \mu\text{m} = 0.03\text{mm}$$

**Answer:** c) 0.03mm