

Previous Year JEE Questions

Q4: A single slit of width 0.2 mm is illuminated with light of wavelength 500 nm. The observing screen is placed 80 cm from the slit. The width of the central bright fringe will be

Wavelength $\lambda = 500 \text{ nm} = 500 \times 10^{-9} \text{ m}$
width of slit $d = 0.2 \text{ mm} = 0.2 \times 10^{-3} \text{ m}$
Distance of screen $D = 80 \text{ cm} = 80 \times 10^{-2} \text{ m}$

width of central maxima $(w) = \frac{\lambda D}{d}$

$$w = \frac{500 \times 10^{-9} \times 80 \times 10^{-2}}{0.2 \times 10^{-3}} = 2 \times 10^{-3} \text{ m}$$

$w = 2 \text{ mm}$