

## Previous Year JEE Questions

**Q3: A single slit of width 0.1 mm is illuminated by a parallel beam of light of wavelength 6000 Å and diffraction bands are observed on a screen 0.5 m from the slit. The distance of the third dark band from the central bright band is :**

**Soln**

Minima for a single slit diffraction is given by:

$$\Rightarrow \sin\theta = \frac{m\lambda}{a}$$

$$\Rightarrow \theta = \sin^{-1} \left( \frac{3 \times 6 \times 10^{-7}}{0.1 \times 10^{-3}} \right)$$

$\sin\theta$  is very small

$$\Rightarrow \sin\theta \simeq \tan\theta = \frac{y}{0.5}$$

$$\Rightarrow y = \frac{0.5 \times 3 \times 6 \times 10^{-7}}{0.1 \times 10^{-3}} y = 9\text{mm}$$

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