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Answers to NCERT/CBSE PHYSICS Class 12(Class XII)textbook Exercise and Additional exercise

CHAPTER Eight

ELECTROMAGNETIC WAVES

EXERCISES

(For simplicity in numerical calculations, take $g = 10 \text{ m s}^{-2}$)

10.19 A parallel beam of light of wavelength 500 nm falls on a narrow slit and the resulting diffraction pattern is observed on a screen 1 m away. It is observed that the first minimum is at a distance of 2.5 mm from the centre of the screen. Find the width of the slit.

10.19 The fringe width of 1st minimum is $y = \frac{\lambda D}{d}$

$$\lambda = 500 \text{ nm}, \quad D = 1 \text{ m}, \quad y = 2.5 \text{ mm}$$

$$2.5 \times 10^{-3} = \frac{500 \times 10^{-9} \times 1}{d}$$

$$d = 0.2 \times 10^{-9} \text{ m}$$

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