

Q 01 In a single slit diffraction experiment, the width of the slit is made double the original width. How does this affect the size and intensity of the central diffraction band.

Sol. Width of central diffraction band $= 2D \frac{\lambda}{a}$. So, if we double the slit size, the width of the central maxima decreases by half.

When the width of the central maxima is reduced to half, the area of the central diffraction band will become one fourth. Therefore, the intensity becomes four times (because $I \propto a^2$).