

Q.6 Consider sunlight incident on a pinhole of width 103 \AA . The image of the pinhole seen on a screen shall be

- (a) a sharp white ring**
- (b) different from a geometrical image**
- (c) a diffused central spot, white in colour**
- (d) diffused coloured region around a sharp central white spot**

Solution: (b, d)

Key concept: Diffraction of Light can be observed only if the size of obstacle/aperture is less than the wavelength of light.

Given, width of pinhole = $103 \text{ \AA} = 1000 \text{ \AA}$

We know that wavelength of sunlight ranges from 4000 \AA to 8000 \AA . Clearly, wavelength $\lambda <$ width

of the slit.

Hence, light is diffracted from the hole. Due to diffraction from the slit the image formed on the screen will be different from the geometrical image