



Video Solution on Website:-

<https://physicsaholics.com/home/courseDetails/33>

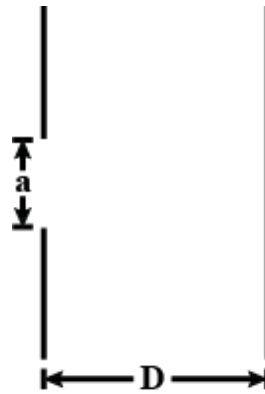
Video Solution on YouTube:-

<https://youtu.be/L0oY-vstrOc>

Written Solution on Website:-

<https://physicsaholics.com/note/notesDetails/46>

- Q 1. The first diffraction minima due to a single slit diffraction is at $\theta = 30^\circ$ for a light of wavelength 5000\AA . The width of the slit is
- (a) $5 \times 10^{-5}\text{ cm}$ (b) $10 \times 10^{-5}\text{ cm}$
(c) $2.5 \times 10^{-5}\text{ cm}$ (d) $1.25 \times 10^{-5}\text{ cm}$
- Q 2. A slit of width a is illuminated by white light. The first minimum for red light ($\lambda = 6500\text{\AA}$) will fall at $\theta = 30^\circ$ when a will be
- (a) 3250\AA (b) $6.5 \times 10^{-4}\text{ cm}$
(c) 1.3 micron (d) $2.6 \times 10^{-4}\text{ cm}$
- Q 3. What will be the wavelength of the X-rays which give a diffraction angle 2θ equal to 16.80° for a crystal, if the inter planer distance in the crystal is 0.200 nm and only first order diffraction is observed ($\sin 8.40^\circ = 0.146$).
- (a) $5.84 \times 10^{-9}\text{ cm}$ (b) $2.84 \times 10^{-11}\text{ cm}$
(c) $3.64 \times 10^{-9}\text{ cm}$ (d) $1.54 \times 10^{-11}\text{ cm}$
- Q 4. Light waves of wave length λ propagate in a medium. If M and N are two points on the same wave front and they are separated by a distance $\lambda/4$, the phase difference between them will be (in radian)
- (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{8}$
(c) $\frac{\pi}{45}$ (d) zero
- Q 5. A beam of light of wavelength 600 nm from a distance source falls on a single slit 1 mm wide and a resulting diffraction pattern is observed on a screen 2 m away. The distance between the first dark fringes on either side of central bright fringe is
- (a) 0.2 mm (b) 1.7 cm
(c) 1.2 mm (d) 2.4 cm
- Q 6. Consider the shown arrangement to obtain diffraction pattern when a monochromatic radiation of wavelength λ is incident on the narrow aperture. If $a=3\lambda$, in the diffraction pattern obtained on screen, the number of intensity minima seen on screen would be



- (a) 3 (b) 4
(c) 5 (d) 6

- Q 7. When white light is incidence on a diffraction grating, then the zero order maximum will be
- (a) spectrum of colours (b) white
(c) one of the component colours (d) absent
- Q 8. A linear aperture whose width is 0.02 cm is placed immediately in front of a lens of focal length 60 cm. The aperture is illuminated normally by a parallel beam of wavelength 5×10^{-5} cm. The distance of the first dark band of the diffraction pattern from the center of the screen is:
- (a) 0.15 cm (b) 0.10 cm
(c) 0.25 cm (d) 0.20 cm
- Q 9. A single slit of width 0.1mm is illuminated by parallel light of wavelength 6000\AA , and diffraction bands are observed on a screen 40cm from the slit. The distance of third dark band from the central bright band is:
- (a) 7.2 mm (b) 3.6 mm
(c) 2.4 mm (d) 0.6 mm
- Q 10. Light of wavelength 6000\AA is incident on a slit of width 0.30 mm. The screen is placed 2 m from the slit. Find (a) the position of the first dark fringe and (b). The width of the central bright fringe.
- (a) 3mm, 6mm (b) 2mm, 4mm
(c) 2mm, 6mm (d) 4mm, 8mm
- Q 11. A diffraction is obtained by using a beam of red light. What will happen if the red light is replaced by the blue light
- (a) Bands will narrower and crowded together
(b) Bands become broader and further apart
(c) No change will take place
(d) Bands disappear
- Q 12. What will be the angle of diffracting for the first minimum due to Fraunhofer diffraction with sources of light of wave length 550 nm and slit of width 0.55 mm



- (a) 0.001 rad (b) 0.01 rad
(c) 1 rad (d) 0.1 rad

- Q 13. If wavelength 4500\AA and 6000\AA are found to be missing in the reflected spectrum in thin air film interference, the thickness of the film for normal incidence is nearly
(a) 9000\AA (b) 10500\AA
(c) 5250\AA (d) 4240\AA
- Q 14. A parallel beam of white light is incident on a thin film of air of uniform thickness. Wavelengths 7200\AA and 5400\AA are observed to be missing from the spectrum of reflected light viewed normally. The other wavelength in the visible region missing in the reflected spectrum is
(a) 6000\AA (b) 4320\AA
(c) 5500\AA (d) 6500\AA
- Q 15. A glass of refractive index 1.5 is coated with a thin layer of thickness of t of refractive index 1.8. Light of wavelength 648 nm travelling in air is incident normally on the layer. It is partly reflected at upper and lower surfaces of the layer and the rays interfere constructively. Minimum thickness of layer is?
(a) 2 (b) 15
(c) 9 (d) 60
- Q 16. A light of wavelength 5890\AA falls normally on a thin air film. The minimum thickness of the film such that the film appears dark in reflected light is
(a) $2.945 \times 10^{-7}\text{ m}$ (b) $3.945 \times 10^{-7}\text{ m}$
(c) $4.95 \times 10^{-7}\text{ m}$ (d) $1.945 \times 10^{-7}\text{ m}$

Answer Key

Q.1 b	Q.2 c	Q.3 a	Q.4 d	Q.5 d
Q.6 b	Q.7 b	Q.8 a	Q.9 a	Q.10 d
Q.11 a	Q.12 a	Q.13 a	Q.14 b	Q.15 c
Q.16 a				