

NEET WAVE OPTICS — DIFFRACTION AT A SINGLE SLIT — PYQS

Max. Marks: 28

Questions: 7

Section A (MCQ) — 7 questions

Q.1 In a diffraction pattern due to a single slit of width a , the first minimum is observed at an angle 30° when light of wavelength $5000 \text{ \AA}$ is incident on the slit. The first secondary maximum is observed at an angle of

[NEET 2016 (Phase 1)]

- (1) $\sin^{-1}\left(\frac{1}{2}\right)$ (2) $\sin^{-1}\left(\frac{3}{4}\right)$
 (3) $\sin^{-1}\left(\frac{1}{4}\right)$ (4) $\sin^{-1}\left(\frac{2}{3}\right)$

 Scan or tap for the
full solution


Q.2 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 $5 \times 10^{-5} \text{ cm}$. The distance of the first dark band of the diffraction pattern from the centre of the screen is

[NEET 2016 (Phase 2)]

- (1) 0.10 cm (2) 0.25 cm (3) 0.20 cm (4) 0.15 cm

 Scan or tap for the
full solution


Q.3 At the first minimum adjacent to the central maximum of a single-slit diffraction pattern, the phase difference between the Huygen's wavelet from the edge of the slit and the wavelet from the midpoint of the slit is

[AIPMT 2015]

- (1) π radian (2) $\frac{\pi}{8}$ radian (3) $\frac{\pi}{4}$ radian (4) $\frac{\pi}{2}$ radian

 Scan or tap for the
full solution


Q.4 For a parallel beam of monochromatic light of wavelength ' λ ', diffraction is produced by a single slit whose width ' a ' is of the order of the wavelength of the light. If ' D ' is the distance of the screen from the slit, the width of the central maxima will be

[AIPMT 2015 (Cancelled)]

- (1) $\frac{Da}{\lambda}$ (2) $\frac{2Da}{\lambda}$ (3) $\frac{2D\lambda}{a}$ (4) $\frac{D\lambda}{a}$

 Scan or tap for the
full solution


Q.5 In a double slit experiment, the two slits are 1 mm apart and the screen is placed 1 m away. A monochromatic light of wavelength 500 nm is used. What will be the width of each slit for obtaining ten maxima of double slit within the central maxima of single slit pattern?

[AIPMT 2015 (Cancelled)]

- (1) 0.5 mm (2) 0.02 mm
 (3) 0.2 mm (4) 0.1 mm

 Scan or tap for the
full solution


Q.6 A beam of light of $\lambda = 600 \text{ nm}$ from a distant source falls on a single slit 1 mm wide and the resulting diffraction pattern is observed on a screen 2 m away. The distance between first dark fringes on either side of the central bright fringe is

[AIPMT 2014]

- (1) 1.2 cm (2) 1.2 mm (3) 2.4 cm (4) 2.4 mm

 Scan or tap for the
full solution


Q.7 A parallel beam of light of wavelength λ is incident normally on a narrow slit. A diffraction pattern is formed on a screen placed perpendicular to the direction of the incident beam. At the second minimum of the diffraction pattern, the phase difference between the rays coming from the two edges of slit is

[NEET 2013 (Karnataka)]

- (1) 2π (2) 3π (3) 4π (4) $\pi\lambda$

 Scan or tap for the
full solution


ANSWER KEY

Ques.	1	2	3	4	5	6	7				
Ans.	2	4	1	3	3	4	3				