

JEE MAIN WAVE OPTICS — DIFFRACTION AT A SINGLE SLIT — PYQS

Max. Marks: 20
Questions: 5

Section A (MCQ) — 2 questions

Q.1 A slit of width a is illuminated by light of wavelength λ . The linear separation between 1st and 3rd minima in the diffraction pattern produced on a screen placed at a distance D from the slit system is _____.

[JEE Main 2026 (Online) 4th April Morning Shift]

- (1) $\frac{D\lambda}{a}$ (2) $1.5\frac{D\lambda}{a}$ (3) $2\frac{D\lambda}{a}$ (4) $3\frac{D\lambda}{a}$

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Q.2 Which of the following are true for a single slit diffraction?

- A. Width of central maxima increases with increase in wavelength keeping slit width constant.
- B. Width of central maxima increases with decrease in wavelength keeping slit width constant.
- C. Width of central maxima increases with decrease in slit width at constant wavelength.
- D. Width of central maxima increases with increase in slit width at constant wavelength.
- E. Brightness of central maxima increases for decrease in wavelength at constant slit width.

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) B, D only (2) A, D only
(3) A, C, E only (4) B, C only

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Section B (Numerical) — 3 questions

Q.3 In single slit diffraction pattern, the wavelength of light used is 628 nm and slit width is 0.2 mm, the angular width of central maximum is $\alpha \times 10^{-2}$ degrees. The value of α is _____.

[JEE Main 2026 (Online) 2nd April Morning Shift]

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Q.4 In a Young's double slit experiment, two slits are located 1.5 mm apart. The distance of screen from slits is 2 m and the wavelength of the source is 400 nm. If the 20 maxima of the double slit pattern are contained within the central maximum of the single slit diffraction pattern, then the width of each slit is $x \times 10^{-3}$ cm, where x -value is _____.

[JEE Main 2025 (Online) 4th April Evening Shift]

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Q.5 If the measured angular separation between the second minimum to the left of the central maximum and the third minimum to the right of the central maximum is 30° in a single slit diffraction pattern recorded using 628 nm light, then the width of the slit is _____ μm .

[JEE Main 2025 (Online) 2nd April Morning Shift]

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ANSWER KEY

Section A (MCQ) — 2 questions

Ques.	1	2												
Ans.	3	3												

Section B (Numerical) — 3 questions

Ques.	3	4	5											
Ans.	36	15	6											