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NEET WAVE OPTICS — PYQS

Max. Marks: 156 **Questions:** 39

Section A (MCQ) — 39 questions

Q.1 In Young's double slit experiment, using monochromatic light of wavelength λ, the intensity of light at a point on the screen where the path difference is λ, is K units. The intensity of light at a point where the path difference is $\frac{\lambda}{3}$ will be : [NEET (UG) 2026]

(1) K (2) 2 K (3) $\frac{K}{2}$ (4) $\frac{K}{4}$

Scan or tap for the full solution

Q.2 In interference and diffraction, the light energy is redistributed. If it reduces in one region, producing a dark fringe, it increases in another region, producing a bright fringe.

A. As there is no gain or loss of energy, these phenomena are consistent with the principle of conservation of energy.

B. Diffraction and interference are characteristics exhibited only by light waves.

Choose the correct answer from the options given below : [NEET (UG) 2026]

(1) A is false, but B is true

(2) A is true, but B is false

(3) A is true and B is also true

(4) Both A and B are false

Solution

Q.3 The intensity of transmitted light when a polaroid sheet, placed between two crossed polaroids at 22.5° from the polarization axis of one of the polaroids, is (I_0 is the intensity of polarised light after passing through the first polaroid): [NEET (UG) 2025]

(1) $\frac{I_0}{8}$ (2) $\frac{I_0}{16}$ (3) $\frac{I_0}{2}$ (4) $\frac{I_0}{4}$

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Q.4 An unpolarized light beam travelling in air is incident on a medium of refractive index 1.73 at Brewster's angle. Then [NEET (UG) 2025]

(1) Both reflected and transmitted light are perfectly polarized with angles of reflection and refraction close to 60° and 30°, respectively

(2) Transmitted light is completely polarized with angle of refraction close to 30°

(3) Reflected light is completely polarized and the angle of reflection is close to 60°

(4) Reflected light is partially polarized and the angle of reflection is close to 30°

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Q.5 If the monochromatic source in Young's double slit experiment is replaced by white light, then [NEET (UG) 2024]

(1) Interference pattern will disappear

(2) There will be a central dark fringe surrounded by a few coloured fringes

(3) There will be a central bright white fringe surrounded by a few coloured fringes

(4) All bright fringes will be of equal width

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Q.6 An unpolarised light beam strikes a glass surface at Brewster's angle. Then [NEET (UG) 2024]

(1) The reflected light will be partially polarised.

(2) The refracted light will be completely polarised.

(3) Both the reflected and refracted light will be completely polarised.

(4) The reflected light will be completely polarised but the refracted light will be partially polarised.

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Q.7 Two slits in Young's double slit experiment are 1.5 mm apart and the screen is placed at a distance of 1 m from the slits. If the wavelength of light used is 600×10^{-9} m then the fringe separation is [RE-NEET (UG) 2024]

(1) 4×10^{-5} m (2) 9×10^{-8} m

(3) 4×10^{-7} m (4) 4×10^{-4} m

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Q.8 Interference pattern can be observed due to superposition of the following waves:

A. $y = a\sin\omega t$ B. $y = a\sin 2\omega t$

C. $y = a\sin(\omega t - \phi)$ D. $y = a\sin 3\omega t$

Choose the correct answer from the options given below. [RE-NEET (UG) 2024]

(1) B and C (2) B and D
(3) A and C (4) A and B

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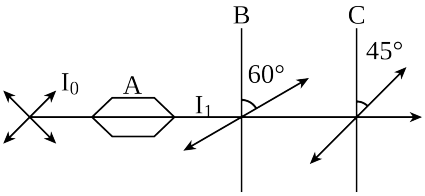
Q.9 A beam of unpolarized light of intensity I_0 is passed through a polaroid A, then through another polaroid B, oriented at 60° and finally through another polaroid C, oriented at 45° relative to B as shown. The intensity of emergent light is:

[RE-NEET (UG) 2024]



(1) $\frac{I_0}{16}$ (2) $\frac{I_0}{4}$ (3) $\frac{I_0}{2}$ (4) $\frac{I_0}{32}$

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Q.10 For Young's double slit experiment, two statements are given below :

Statement-I: If screen is moved away from the plane of slits, angular separation of the fringes remains constant.

Statement-II: If the monochromatic source is replaced by another monochromatic source of larger wavelength, the angular separation of fringes decreases.

In the light of the above statements, choose the correct answer from the options given below :

[NEET (UG) 2023]

(1) Both Statement-I and Statement-II are false
(2) Statement-I is true but Statement-II is false
(3) Statement-I is false but Statement-II is true
(4) Both Statement-I and Statement-II are true

Scan or tap for the full solution

Q.11 In a Young's double slit experiment, a student observes 8 fringes in a certain segment of screen when a monochromatic light of 600 nm wavelength is used. If the wavelength of light is changed to 400 nm, then the number of fringes he would observe in the same region of the screen is

[NEET (UG) 2022]

(1) 6 (2) 8 (3) 9 (4) 12

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Q.12 A light ray falls on a glass surface of refractive index $\sqrt{3}$, at an angle 60°. The angle between the refracted and reflected rays would be

[NEET (UG) 2022]

(1) 30° (2) 60° (3) 90° (4) 120°

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Q.13 If the screen is moved away from the plane of the slits in a Young's double slit experiment, then the :

[NEET (UG) 2022 (Phase 2)]

(1) linear separation of the fringes decreases
(2) angular separation of the fringes increases
(3) angular separation of the fringes decreases
(4) linear separation of the fringes increase

Scan or tap for the full solution

Q.14 After passing through a polariser a linearly polarised light of intensity I is incident on an analyser making an angle of 30° with that of the polariser. The intensity of light emitted from the analyser will be

[NEET (UG) 2022 (Phase 2)]

(1) $\frac{2I}{3}$ (2) $\frac{I}{2}$ (3) $\frac{I}{3}$ (4) $\frac{3I}{4}$

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Q.15 Assume that light of wavelength 600 nm is coming from a star. The limit of resolution of telescope whose objective has a diameter of 2 m is :

[NEET (UG) 2020]

(1) 1.83×10^{-7} rad (2) 7.32×10^{-7} rad
(3) 6.00×10^{-7} rad (4) 3.66×10^{-7} rad

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Q.16 In Young's double slit experiment, if the separation between coherent sources is halved and the distance of the screen from the coherent sources is doubled, then the fringe width becomes : [NEET (UG) 2020]

(1) half (2) four times
(3) one-fourth (4) double

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Q.17 The Brewster's angle i_b for an interface should be :

[NEET (UG) 2020]

(1) $30° < i_b < 45°$ (2) $45° < i_b < 90°$
(3) $i_b = 90°$ (4) $0° < i_b < 30°$

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Q.18 In a double slit experiment, when light of wavelength 400 nm was used, the angular width of the first minima formed on a screen placed 1 m away, was found to be 0.2°. What will be the angular width of the first minima, (μ_{water} = 4/3) if the entire experimental apparatus is immersed in water? [NEET (UG) 2019]

(1) 0.15° (2) 0.05° (3) 0.1° (4) 0.266°

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Q.19 Unpolarised light is incident from air on a plane surface of a material of refractive index μ. At a particular angle of incidence i, it is found that the reflected and refracted rays are perpendicular to each other. Which of the following options is correct for this situation? [NEET 2018]

(1) Reflected light is polarised with its electric vector parallel to the plane of incidence

(2) Reflected light is polarised with its electric vector perpendicular to the plane of incidence

(3) $i = \sin^{-1}\left(\frac{1}{\mu}\right)$

(4) $i = \tan^{-1}\left(\frac{1}{\mu}\right)$

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Q.20 In Young's double slit experiment the separation d between the slits is 2 mm, the wavelength λ of the light used is 5896 Å and distance D between the screen and slits is 100 cm. It is found that the angular width of the fringes is 0.20°. To increase the fringe angular width to 0.21° (with same λ and D) the separation between the slits needs to be changed to [NEET 2018]

(1) 1.9 mm (2) 1.8 mm (3) 2.1 mm (4) 1.7 mm

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Q.21 The ratio of resolving powers of an optical microscope for two wavelengths $\lambda_1 = 4000$ Å and $\lambda_2 = 6000$ Å is [NEET 2017]

(1) 9 : 4 (2) 3 : 2 (3) 16 : 81 (4) 8 : 27

Scan or tap for the full solution

Q.22 Young's double slit experiment is first performed in air and then in a medium other than air. It is found that 8th bright fringe in the medium lies where 5th dark fringe lies in air. The refractive index of the medium is nearly [NEET 2017]

(1) 1.59 (2) 1.69 (3) 1.78 (4) 1.25

Scan or tap for the full solution

Q.23 Two polaroids P_1 and P_2 are placed with their axis perpendicular to each other. Unpolarised light I_0 is incident on P_1. A third polaroid P_3 is kept in between P_1 and P_2 such that its axis makes an angle 45° with that of P_1. The intensity of transmitted light through P_2 is [NEET 2017]

(1) $\frac{I_0}{4}$ (2) $\frac{I_0}{8}$ (3) $\frac{I_0}{16}$ (4) $\frac{I_0}{2}$

Scan or tap for the full solution

Q.24 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 Å 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.25 The intensity at the maximum in a Young's double slit experiment is I_0. Distance between two slits is d = 5λ, where λ is the wavelength of light used in the experiment. What will be the intensity in front of one of the slits on the screen placed at a distance D = 10d? [NEET 2016 (Phase 1)]

(1) $\frac{3}{4}I_0$ (2) $\frac{I_0}{2}$ (3) I_0 (4) $\frac{I_0}{4}$

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Q.26 The interference pattern is obtained with two coherent light sources of intensity ratio n. In the interference pattern, the ratio $\frac{I_{max} - I_{min}}{I_{max} + I_{min}}$ will be [NEET 2016 (Phase 2)]

(1) $\frac{\sqrt{n}}{n+1}$ (2) $\frac{2\sqrt{n}}{n+1}$

(3) $\frac{\sqrt{n}}{(n+1)^2}$ (4) $\frac{2\sqrt{n}}{(n+1)^2}$

Scan or tap for the full solution

Q.27 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 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

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Q.28 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.29 Two slits in Young's experiment have widths in the ratio 1 : 25. The ratio of intensity at the maxima and minima in the interference pattern, $\frac{I_{max}}{I_{min}}$ is [AIPMT 2015]

(1) $\frac{49}{121}$ (2) $\frac{4}{9}$ (3) $\frac{9}{4}$ (4) $\frac{121}{49}$

Scan or tap for the full solution

Q.30 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.31 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

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Q.32 A beam of light of λ = 600 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.33 In the Young's double slit experiment, the intensity of light at a point on the screen where the path difference is λ is K, (λ being the wavelength of light used). The intensity at a point where the path difference is λ/4 will be [AIPMT 2014]

(1) K (2) K/4 (3) K/2 (4) zero

Scan or tap for the full solution

Q.34 In Young's double slit experiment, the slits are 2 mm apart and are illuminated by photons of two wavelengths $\lambda_1 = 12000$ Å and $\lambda_2 = 10000$ Å. At what minimum distance from the common central bright fringe on the screen 2 m from the slit will a bright fringe from one interference pattern coincide with a bright fringe from the other ? [NEET 2013]

(1) 4 mm (2) 3 m (3) 8 mm (4) 6 mm

Scan or tap for the full solution

Q.35 In Young's double slit experiment the distance between the slits and the screen is doubled. The separation between the slits is reduced to half. As a result the fringe width [NEET 2013 (Karnataka)]

(1) is halved (2) becomes four times
(3) remains unchanged (4) is doubled

Scan or tap for the full solution

Q.36 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) πλ

Scan or tap for the full solution

Q.37 The angular resolution of a 10 cm diameter telescope at a wavelength of 5000 Å is of the order of [AIPMT 2005]

(1) 10^6 rad (2) 10^{-2} rad (3) 10^{-4} rad (4) 10^{-6} rad.

Scan or tap for the full solution

Q.38 A telescope has an objective lens of 10 cm diameter and is situated at a distance of one kilometer from two objects. The minimum distance between these two objects, which can be resolved by the telescope, when the mean wavelength of light is 5000 Å, is of the order of [AIPMT 2004]

(1) 0.5 m (2) 5 m (3) 5 mm (4) 5 cm

Scan or tap for the full solution

Q.39 Diameter of human eye lens is 2 mm. What will be the minimum distance between two points to resolve them, which are situated at a distance of 50 metre from the eye? The wavelength of light is 5000 Å. [AIPMT 2002]

(1) 2.32 m (2) 4.28 mm
(3) 1.25 cm (4) 12.48 cm

Scan or tap for the full solution

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	**4**	**2**	**1**	**3**	**3**	**4**	**4**	**3**	**1**	**2**	**4**
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	**3**	**4**	**4**	**4**	**2**	**2**	**1**	**2**	**1**	**2**	**3**
Ques.	23	24	25	26	27	28	29	30	31	32	33
Ans.	**2**	**2**	**2**	**2**	**4**	**1**	**3**	**3**	**3**	**4**	**3**
Ques.	34	35	36	37	38	39					
Ans.	**4**	**2**	**3**	**4**	**3**	**3**					

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