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PHYSICS · JEE MAIN

Wave Optics

Previous Year Questions with answers

189 questions · **153** papers · **2003–2026** · newest paper first

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What is in this PDF: every Wave Optics question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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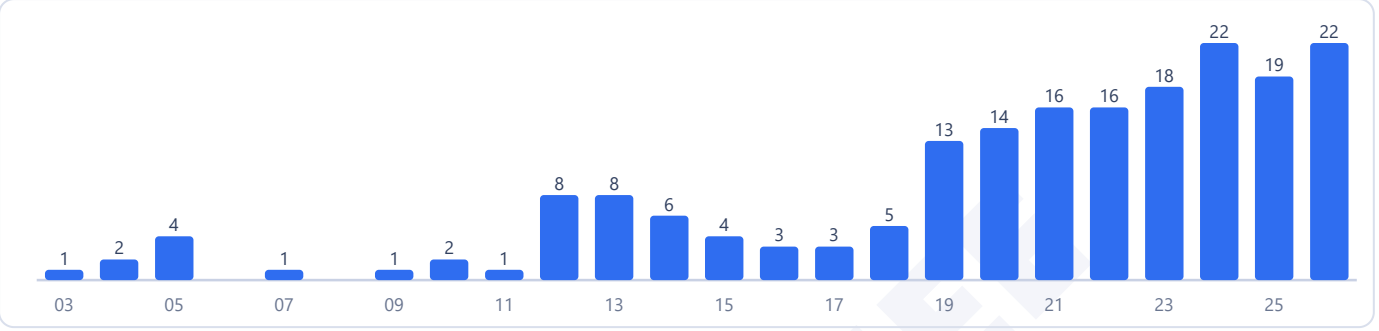
Chapter at a glance

3.1%	189	119 of 162	139 / 50
of Physics questions, 2019–2026	questions, 2003–2026	papers asked it, 2019–2026	MCQ / numerical, 2003–2026

Trend. Rising: 1.1 questions per paper in 2024–2026 against 0.7 in 2019–2023.

Questions per year



Counts are the questions we hold: 189 in 153 papers. 2 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2003–2026)

Interference	113
Diffraction & Polarisation	68
Huygens' Principle	8

How often it comes up

Wave optics examines the wave nature of light under Unit 16: Optics in the Class 12 curriculum, holding rank 19 among 29 physics chapters with a 3.1 percent share of total physics questions. In the computer-based testing window spanning 2019 to 2026, candidates answered 140 questions across 162 test papers, delivering an average of 0.9 problems in each sitting. The topic was included in 119 of those 162 papers, appearing consistently in every single exam year. During the recent 2024 to 2026 period, testing recorded 63 questions across 58 papers, lifting the average to 1.1 questions per shift and achieving a 4.1 percent subject share. This marks a trend that is up compared to the 3.1 percent share from the full 2019 to 2026 baseline. When measured against the 2002 to 2018 window, which logged 49 questions across 38 papers for a 3.6 percent share, the chapter's share has stayed about the same. In 2026 alone, examiners presented 22 questions across 19 papers, featured in 17 separate sessions. Across the 2019 to 2026 span, 50 questions appeared in numerical answer format, requiring students to calculate fringe shifts, slit widths, and intensity ratios without choices.

Most-asked topics

Questions from wave optics fall into three primary subject areas:

- **Interference**: 113 questions since 2003, with 90 appearing between 2019 and 2026, tested up to 2026. This dominant area tests Young's double slit experiment, fringe width variations, introduction of thin transparent glass sheets causing fringe shifts, overlapping bright fringes of multiple wavelengths, and intensity expressions as a function of phase difference.
- **Diffraction & Polarisation**: 68 total questions, including 45 between 2019 and 2026, continuing into 2026. Core concepts evaluate single-slit Fraunhofer diffraction, angular width of the central diffraction peak, secondary maxima positions, Brewster's law, polarization by reflection, and Malus's law.

- **Huygens' Principle**: 8 lifetime questions, with 5 asked between 2019 and 2026, tested in 2026. Themes assess wavefront shapes from point, line, and distant sources, reflection and refraction laws proved by secondary wavelets, and wavefront distortion after passing through prisms, lenses, or pinholes.

What the questions look like

JEE Main problems in wave optics combine wave geometry with precise algebraic formulas:

- **Fringe displacement by transparent slabs**: Inserting a thin transparent film of known thickness and refractive index over one slit introduces an extra optical path, displacing the central interference fringe by a measurable distance on the screen.
- **Angular separation and parameters in double slit setups**: Questions test how angular fringe width depends purely on wavelength and slit spacing while remaining independent of screen distance.
- **Central diffraction maximum width**: Determining the linear or angular spread of the central maximum in single-slit diffraction as a function of slit aperture and incident light color.
- **Brewster's angle and polarization by reflection**: Finding the required angle of incidence on a dielectric surface where reflected and refracted rays travel at ninety degrees to each other, rendering the reflected beam completely plane-polarized.

How to practise it

Focus on the mathematical formulas of Young's double slit experiment. Remember the distinction between linear fringe width beta equal to lambda capital D over small d, and angular fringe width theta equal to lambda over small d. Screen distance changes affect only linear fringe width, leaving angular separation unchanged.

Pay close attention to optical path length. When a light ray traverses a medium of thickness t and refractive index n, the extra optical path introduced is n minus one multiplied by t. Equating this optical path difference to fringe shift formulas solves almost all slab insertion problems.

For single slit diffraction, do not confuse minima conditions with double slit maxima. In single slit diffraction, minima occur where slit width multiplied by sin theta equals non-zero integer multiples of wavelength, while the central maximum spans twice this angular value.

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Q1 JEE Main 2026 · 6 Apr · Shift 1 MCQ

In interference experiment the path difference between two interfering waves at a point A on the screen is $\lambda/3$, where λ is the wavelength of these waves, and at another point B the path difference is $\lambda/6$. The ratio of intensities at points A and B is _____.

(A) 3
(B) 4
(C) 1/3
(D) 1/4

Answer: (C) 1/3 · Official NTA final key

Q2 JEE Main 2026 · 6 Apr · Shift 1 Numerical

An unpolarized light of intensity I_o passes through polarizer and then through a certain optically active solution and finally it goes to analyser. If the angle between analyser and polariser is 0° and intensity of light emerged from analyser is $\frac{3}{8}I_o$, the angle of rotation of the light by the solution with respect to analyser is _____ degrees.

Numerical value type: the answer is a number.

Answer: 30. · Official NTA final key

Q3 JEE Main 2026 · 6 Apr · Shift 2 MCQ

In a Young double slit experiment, the wavelength of incident light is 6000 Å, the separation between slits S_1 and S_2 is 5 cm and the distance between slits plane and screen is 50 cm, as shown in the figure below. If the resultant intensity at P is equal to the intensity due to individual slits, the path difference between interfering waves is _____ Å.

(see the figure above)

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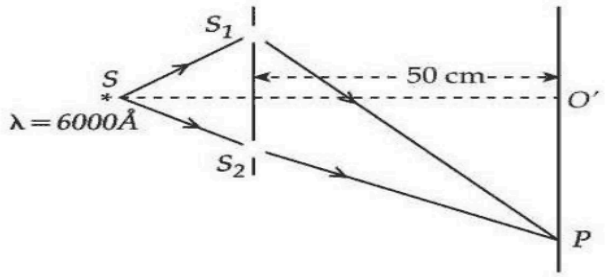
In a Young double slit experiment, the wavelength of incident light is 6000 Å, the separation between slits S_1 and S_2 is 5 cm and the distance between slits plane and screen is 50 cm, as shown in the figure below. If the resultant intensity at P is equal to the intensity due to individual slits, the path difference between interfering waves is _____ Å.



Options :

6911214242. 4000

6911214243. 3000

6911214244. 2000

6911214245. 1000

(A) 4000
(B) 3000
(C) 2000
(D) 1000

Options (1) or (3) were accepted. More than one answer was accepted. · Official NTA final key

Q4 JEE Main 2026 · 5 Apr · Shift 1 MCQ

In Young's double slit experiment, the fringe width of the interference pattern produced on the screen is 2.4 μm. If the experiment is carried out in another medium having refractive index 1.2, the fringe width will be _____ μm.

(A) 1.2
(B) 2
(C) 2.4
(D) 2.88

Answer: (B) 2 · Official NTA final key

Q5 JEE Main 2026 · 5 Apr · Shift 2 MCQ

The maximum intensity in a Young's double slit experiment is I_o. Distance between the slits (d) is 5λ, where λ is the wavelength of light used. The intensity of the fringe, exactly opposite to one of the slits on the screen, placed at $D = 10d$ is _____.

(A) $\frac{I_o}{4}$
(B) $\frac{I_o}{2}$
(C) I_o
(D) $\frac{3I_o}{4}$

Answer: (B) $\frac{I_o}{2}$ · Official NTA final key

Q6 JEE Main 2026 · 4 Apr · Shift 1 MCQ

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 _____.

(A) $\frac{D\lambda}{a}$
(B) $1.5\,\frac{D\lambda}{a}$
(C) $2\,\frac{D\lambda}{a}$
(D) $3\,\frac{D\lambda}{a}$

Answer: (C) $2\,\frac{D\lambda}{a}$ · Official NTA final key

Q7 JEE Main 2026 · 4 Apr · Shift 1 MCQ

A telescope with objective diameter R is used to observe a distant star emitting light of wavelength 500 nm, at a resolution of 5×10^{-7} radian. The value of R is _____ cm.

(A) 61
(B) 122
(C) 244
(D) 305

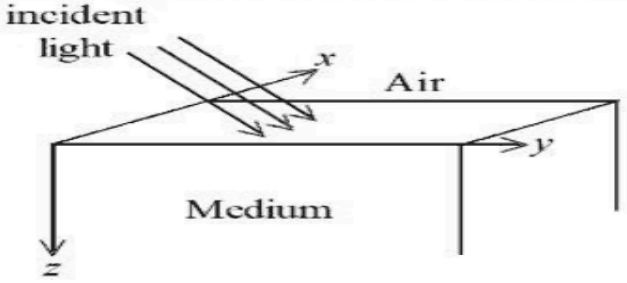
Answer: (B) 122 · Official NTA final key

Q8 JEE Main 2026 · 4 Apr · Shift 1 MCQ

An unpolarized light is incident on the plane interface of air-dielectric medium shown in figure. If the incident angle is equal to Brewster angle, identify the expression representing reflected wave.

(see the figure above)

An unpolarized light is incident on the plane interface of air-dielectric medium shown in figure. If the incident angle is equal to Brewster angle, identify the expression representing reflected wave.



Options :

695278927. $(E_x\hat{i}+E_y\hat{j})\sin(kx-kz-\omega t)$

695278928. $(E_x\hat{i}+E_z\hat{k})\sin(kx+ky-\omega t)$

695278929. $(E_x\hat{j}+E_y\hat{k})\sin(ky+kz-\omega t)$

695278930. $(E_x\hat{i}+E_y\hat{j}+E_z\hat{k})\sin(kx+ky-kz-\omega t)$

(A) $\left(E_x\hat{i}+E_y\hat{j}\right)\sin(kx-kz-\omega t)$

(B) $\left(E_x\hat{i}+E_z\hat{k}\right)\sin(kx+ky-\omega t)$

(C) $\left(E_x\hat{j}+E_y\hat{k}\right)\sin(ky+kz-\omega t)$

(D) $\left(E_x\hat{i}+E_y\hat{j}+E_z\hat{k}\right)\sin(kx+ky-kz-\omega t)$

Answer: (A) $\left(E_x\hat{i}+E_y\hat{j}\right)\sin(kx-kz-\omega t)$ · Official NTA final key

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Q9 JEE Main 2026 · 4 Apr · Shift 2 MCQ

An unpolarized light of certain intensity passes through a combination of two polarizers whose transmission axes are at 30° and 90°, respectively, with respect to the horizontal axis. A third polarizer with its transmission axis at 60° with the horizontal axis is placed between the two existing polarizers. The ratio of the output intensities with and without the third polarizer is _____.

(A) 3/4

(B) 4/3

(C) 9/4

(D) 4/9

Answer: (C) 9/4 · Official NTA final key

Q10 JEE Main 2026 · 4 Apr · Shift 2 Numerical

In a double slit experiment, when one of the slits is covered by a transparent mica sheet of refractive index 1.56, the central fringe shifts to the position of 7th bright fringe, obtained with both slits uncovered. If the light source wavelength is 450 nm, the thickness of mica sheet is $\alpha \times 10^{-9}$ m. The value of α is _____.

Numerical value type: the answer is a number.

Answer: 5625. · Official NTA final key

Q11 JEE Main 2026 · 2 Apr · Shift 1 Numerical

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 _____.

Numerical value type: the answer is a number.

Answer: 36. · Official NTA final key

Q12 JEE Main 2026 · 2 Apr · Shift 2 Numerical

In a Young's double slit experiment, the intensity at some point on the screen is found to be $\frac{3}{4}$ times of the maximum of the interference pattern. The path difference between the interfering waves at this point is $\frac{\lambda}{x}$ where λ is wavelength of the incident light. The value of x is _____.

Numerical value type: the answer is a number.

Answer: 6. · Official NTA final key

Q13 JEE Main 2026 · 28 Jan · Shift 1 MCQ

Given below are two statements:

Statement I: A plane wave after passing through prism remains as plane wave but passing through small pin hole may become spherical wave.

Statement II: The curvature of a spherical wave emerging from a slit will increase for increasing slit width.

In the light of the above statements, choose the *__correct__* answer from the options given below

(A) Both Statement I and Statement II are false
(B) Both Statement I and Statement II are true
(C) Statement I is false but Statement II is true
(D) Statement I is true but Statement II is false

Answer: (D) Statement I is true but Statement II is false · Official NTA final key

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Q14 JEE Main 2026 · 28 Jan · Shift 2 Numerical

A beam of light consisting of wavelengths 650 nm and 550 nm illuminates the Young's double slits with separation of 2 mm such that the interference fringes are formed on a screen, placed at a distance of 1.2 m from the slits. The least distance of a point from the central maximum, where the bright fringes due to both the wavelengths coincide, is _____ $\times 10^{-5}$ m.

Numerical value type: the answer is a number.

Answer: 429. · Official NTA final key

Q15 JEE Main 2026 · 24 Jan · Shift 1 MCQ

An unpolarised light is incident at an interface of two dielectric media having refractive indices of 2 (incident medium) and $2\sqrt{3}$ (medium) respectively. To satisfy the condition that reflected and refracted rays are perpendicular to each other, the angle of incidence is _____.

(A) 45°
(B) 30°
(C) 10°
(D) 60°

Answer: (D) 60° · Official NTA final key

Q16 JEE Main 2026 · 24 Jan · Shift 2 MCQ

In the Young's double slit experiment the intensity produced by each one of the individual slits is I_o. The distance between two slits is 2 mm. The distance of screen from slits is 10 m. The wavelength of light is 6000 Å. The intensity of light on the screen in front of one of the slits is _____.

(A) I_o
(B) $2I_o$
(C) $\frac{I_o}{2}$
(D) $4I_o$

Answer: (A) I_o · Official NTA final key

Q17 JEE Main 2026 · 23 Jan · Shift 1 Numerical

In two separate Young's double-slit experimental set-ups and two monochromatic light sources of different wavelengths are used to get fringes of equal width. The ratios of the slits separations and that of the wavelengths of light used are $2:1$ and $1:2$ respectively. The corresponding ratio of the distances between the slits and the respective screens (D_1/D_2) is _____.

Numerical value type: the answer is a number.

Answer: 4. · Official NTA final key

Q18 JEE Main 2026 · 23 Jan · Shift 2 MCQ

When an unpolarized light falls at a particular angle on a glass plate (placed in air), it is observed that the reflected beam is linearly polarized. The angle of refracted beam with respect to the normal is _____.

$(\tan^{-1}(1.52) = 57.7^\circ$, refractive indices of air and glass are 1.00 and 1.52, respectively.)

(A) 39.6°
(B) 32.3°
(C) 42.6°
(D) 36.3°

Answer: (B) 32.3° · Official NTA final key

Q19 JEE Main 2026 · 22 Jan · Shift 2 MCQ

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.

(A) A, D, E only
(B) B, C only
(C) A, D only
(D) B, D only

Dropped by NTA. Full marks to everyone. · Official NTA final key

Q20 JEE Main 2026 · 21 Jan · Shift 1 MCQ

In a double slit experiment the distance between the slits is 0.1 cm and the screen is placed at 50 cm from the slits plane. When one slit is covered with a transparent sheet having thickness t and refractive index $n(=1.5)$, the central fringe shifts by 0.2 cm. The value of t is _____ cm.

(A) 8×10^{-4}
(B) 6.0×10^{-3}
(C) 5.0×10^{-3}
(D) 5.6×10^{-4}

Answer: (A) 8×10^{-4} · Official NTA final key

Q21 JEE Main 2026 · 21 Jan · Shift 2 MCQ

Given below are two statements :

Statement I : In a Young's double slit experiment, the angular separation of fringes will increase as the screen is moved away from the plane of the slits

Statement II : In a Young's double slit experiment, the angular separation of fringes will increase when monochromatic source is replaced by another monochromatic source of higher wavelength

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

(A) Both **Statement I** and **Statement II** are true
(B) Both **Statement I** and **Statement II** are false
(C) **Statement I** is true but **Statement II** is false
(D) **Statement I** is false but **Statement II** is true

Answer: (D) Statement I is false but Statement II is true · Official NTA final key

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Q22 JEE Main 2026 · 21 Jan · Shift 2 Numerical

In a Young's double slit experiment set up, the two slits are kept 0.4 mm apart and screen is placed at 1 m from slits. If a thin transparent sheet of thickness 20 μm is introduced in front of one of the slits then center bright fringe shifts by 20 mm on the screen. The refractive index of transparent sheet is given by $\frac{\alpha}{10}$, where α is _____.

Numerical value type: the answer is a number.

Answer: 14. · Official NTA final key

Q23 JEE Main 2025 · 8 Apr · Shift 2 MCQ

In a Young's double slit experiment, the source is white light. One of the slits is covered by red filter and another by a green filter. In this case

(1) there shall be an interference pattern, where each fringe's pattern center is green and outer edges is red.

(2) there shall be an interference pattern for red distinct from that for green.

(3) there shall be no interference fringes.

(4) there shall be alternate interference fringes of red and green.

(A)
(B)
(C)
(D)

Answer: (C) · Key from source paper

Q24 JEE Main 2025 · 7 Apr · Shift 1 MCQ

Two plane polarized light waves combine at a certain point whose electric field components are

$E_1 = E_0 \sin \omega t$

$E_2 = E_0 \sin\left(\omega t + \frac{\pi}{3}\right)$

Find the amplitude of the resultant wave.

(A) $3.4E_0$
(B) $0.9E_0$
(C) E_0
(D) $1.7E_0$

Answer: (D) $1.7E_0$ · Key from source paper

Q25 JEE Main 2025 · 4 Apr · Shift 1 MCQ

In a Young's double slit experiment, the slits are separated by 0.2 mm. If the slits separation is increased to 0.4 mm, the percentage change of the fringe width is :

(A) 0%
(B) 100%
(C) 25%
(D) 50%

Answer: (D) 50% · Key from source paper

Q26 JEE Main 2025 · 4 Apr · Shift 2 MCQ

Two polarisers P_1 and P_2 are placed in such a way that the intensity of the transmitted light will be zero. A third polariser P_3 is inserted in between P_1 and P_2, at particular angle between P_2 and P_3. The transmitted intensity of the light passing the through all three polarisers is maximum. The angle between the polarisers P_2 and P_3 is :

(A) π
(B) π
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{3}$

Answer: (C) $\frac{\pi}{4}$ · Key from source paper

Q27 JEE Main 2025 · 4 Apr · Shift 2 Numerical

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 _____ .

Numerical value type: the answer is a number.

Answer: 15. · Key from source paper

Q28 JEE Main 2025 · 3 Apr · Shift 1 Numerical

Two coherent monochromatic light beams of intensities 4 I and 9 I are superimposed. The difference between the maximum and minimum intensities in the resulting interference pattern is xI. The value

of x is _____ .

Numerical value type: the answer is a number.

Answer: 24. · Key from source paper

Q29 JEE Main 2025 · 3 Apr · Shift 2 MCQ

Two monochromatic light beams have intensities in the ratio 1:9. An interference pattern is obtained by these beams. The ratio of the intensities of maximum to minimum is

(A) 4 : 1
(B) 3 : 1
(C) 8 : 1
(D) 9 : 1

Answer: (A) 4 : 1 · Key from source paper

Q30 JEE Main 2025 · 3 Apr · Shift 2 MCQ

Width of one of the two slits in a Young's double slit interference experiment is half of the other slit. The ratio of the maximum to the minimum intensity in the interference pattern is :

(A) $(2\sqrt{2}+1):(2\sqrt{2}-1)$
(B) 3 : 1
(C) $(3+2\sqrt{2}):(3-2\sqrt{2})$
(D) 9 : 1

Answer: (C) $(3+2\sqrt{2}):(3-2\sqrt{2})$ · Key from source paper

Q31 JEE Main 2025 · 2 Apr · Shift 1 MCQ

A light wave is propagating with plane wave fronts of the type $x+y+z=$ constant. The angle made by the direction of wave propagation with the x -axis is :

(A) $\cos^{-1}\left(\sqrt{\frac{2}{3}}\right)$
(B) $\cos^{-1}\left(\frac{1}{3}\right)$
(C) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$
(D) $\cos^{-1}(2/3)$

Answer: (C) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$ · Key from source paper

Q32 JEE Main 2025 · 2 Apr · Shift 1 Numerical

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 .

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q33 JEE Main 2025 · 28 Jan · Shift 1 Numerical

A double slit interference experiment performed with a light of wavelength 600 nm forms an interference fringe pattern on a screen with 10 th bright fringe having its centre at a distance of 10 mm from the central maximum. Distance of the centre of the same 10th bright fringe from the central maximum when the source of light is replaced by another source of wavelength 660 nm would be _____ mm .

Numerical value type: the answer is a number.

Answer: 11. · Key from source paper

Q34 JEE Main 2025 · 28 Jan · Shift 2 Numerical

A thin transparent film with refractive index 1.4 , is held on circular ring of radius 1.8 cm . The fluid in the film evaporates such that transmission through the film at wavelength 560 nm goes to a minimum every 12 seconds. Assuming that the film is flat on its two sides, the rate of evaporation is _____ $\pi \times 10^{-13}\ \mathrm{m}^3/\mathrm{s}$.

Numerical value type: the answer is a number.

Answer: 54. · Key from source paper

Q35 JEE Main 2025 · 24 Jan · Shift 1 MCQ

The Young's double slit interference experiment is performed using light consisting of 480 nm and 600 nm wavelengths to form interference patterns. The least number of the bright fringes of 480 nm light that are required for the first coincidence with the bright fringes formed by 600 nm light is

(A) 5
(B) 4
(C) 6
(D) 8

Answer: (A) 5 · Key from source paper

Q36 JEE Main 2025 · 24 Jan · Shift 2 MCQ

Young's double slit inteference apparatus is immersed in a liquid of refractive index 1.44. It has slit separation of 1.5 mm . The slits are illuminated by a parallel beam of light whose wavelength in air is 690 nm . The fringe-width on a screen placed behind the plane of slits at a distance of 0.72 m , will be :

(A) 0.23 mm
(B) 0.33 mm
(C) 0.63 mm
(D) 0.46 mm

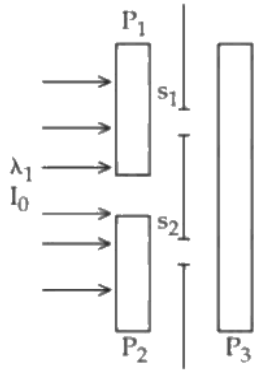
Answer: (A) 0.23 mm · Key from source paper

Q37 JEE Main 2025 · 24 Jan · Shift 2 MCQ

In a Young's double slit experiment, three polarizers are kept as shown in the figure. The transmission axes of P_1 and P_2 are orthogonal to each other. The polarizer P_3 covers both the slits with its transmission axis at 45° to those of P_1 and P_2. An unpolarized light of wavelength λ and intensity I_0 is incident on P_1 and P_2. The intensity at a point after P_3 where the path difference between the light waves from s_1 and s_2 is $\frac{\lambda}{3}$, is

(see the figure above)

Q43. In a Young's double slit experiment, three polarizers are kept as shown in the figure. The transmission axes of P_1 and P_2 are orthogonal to each other. The polarizer P_3 covers both the slits with its transmission axis at 45° to those of P_1 and P_2. An unpolarized light of wavelength λ and intensity I_0 is incident on P_1 and P_2. The intensity at a point after P_3 where the path difference between the light waves from s_1 and s_2 is $\frac{\lambda}{3}$, is



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

(A) $\frac{I_0}{2}$
(B) $\frac{I_0}{4}$
(C) $\frac{I_0}{3}$
(D) I_0

Answer: (B) $\frac{I_0}{4}$ · Key from source paper

Q38 JEE Main 2025 · 23 Jan · Shift 2 MCQ

The width of one of the two slits in Young's double slit experiment is d while that of the other slit is x d. If the ratio of the maximum to the minimum intensity in the interference pattern on the screen is 9 : 4 then what is the value of x ? (Assume that the field strength varies according to the slit width.)

(A) 4
(B) 5
(C) 3
(D) 2

Answer: (B) 5 · Key from source paper

Q39 JEE Main 2025 · 22 Jan · Shift 1 MCQ

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion-(A) : If Young's double slit experiment is performed in an optically denser medium than air, then the consecutive fringes come closer. Reason-(R) : The speed of light reduces in an optically denser medium than air while its frequency does not change. In the light of the above statements, choose the most appropriate answer from the options given below :

(A) Both (**A**) and (**R**) are true but (**R**) is not the correct explanation of (**A**)
(B) Both (**A**) and (**R**) are true and (**R**) is the correct explanation of (**A**)
(C) (A) is true but (R) is false
(D) (*A*) is false but (R) is true

Answer: (B) Both (A) and (R) are true and (R) is the correct explanation of (A) · Key from source paper

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Q40 JEE Main 2025 · 22 Jan · Shift 2 MCQ

A transparent film of refractive index, 2.0 is coated on a glass slab of refractive index, 1.45. What is the minimum thickness of transparent film to be coated for the maximum transmission of Green light of wavelength 550 nm . [Assume that the light is incident nearly perpendicular to the glass surface.]

(A) 137.5 nm
(B) 275 nm
(C) 94.8 nm
(D) 68.7 nm

Answer: (A) 137.5 nm · Key from source paper

Q41 JEE Main 2025 · 22 Jan · Shift 2 MCQ

Given below are two statements. One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : In Young's double slit experiment, the fringes produced by red light are closer as compared to those produced by blue light. Reason (R): The fringe width is directly proportional to the wavelength of light.

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

(A) Both (**A**) and (**R**) are true but (**R**) is NOT the correct explanation of (**A**)

(B) (A) is true but (R) is false

(C) Both (A) and (R) are true and (R) is the correct explanation of (A)

(D) (A) is false but (R) is true

Answer: (D) (A) is false but (R) is true · Key from source paper

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Q42 JEE Main 2024 · 9 Apr · Shift 1 Numerical

In a Young's double slit experiment, the intensity at a point is $\left(\frac{1}{4}\right)^{\text{th}}$ of the maximum intensity, the minimum distance of the point from the central maximum is _____ μm. (Given : λ = 600 nm, d = 1.0 mm, D = 1.0 m)

Numerical value type: the answer is a number.

Answer: 200. · Key from source paper

Q43 JEE Main 2024 · 9 Apr · Shift 2 Numerical

Monochromatic light of wavelength 500 nm is used in Young's double slit experiment. An interference pattern is obtained on a screen. When one of the slits is covered with a very thin glass plate (refractive index = 1.5), the central maximum is shifted to a position previously occupied by the 4th bright fringe. The thickness of the glass-plate is _____ μm.

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q44 JEE Main 2024 · 8 Apr · Shift 1 Numerical

A parallel beam of monochromatic light of wavelength 600 nm passes through single slit of 0.4 mm width. Angular divergence corresponding to second order minima would be _____ $\times 10^{-3}$rad.

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q45 JEE Main 2024 · 8 Apr · Shift 2 Numerical

Two slits are 1 mm apart and the screen is located 1 m away from the slits. A light of wavelength 500 nm is used. The width of each slit to obtain 10 maxima of the double slit pattern within the central maximum of the single slit pattern is _____ $\times 10^{-4}$ m.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q46 JEE Main 2024 · 6 Apr · Shift 2 Numerical

Two coherent monochromatic light beams of intensities I and 4I are superimposed. The difference between maximum and minimum possible intensities in the resulting beam is xI. The value of x is $

_____.

Numerical value type: the answer is a number.

Answer: 8. · Key from source paper

Q47 JEE Main 2024 · 5 Apr · Shift 1 MCQ

Light emerges out of a convex lens when a source of light kept at its focus. The shape of wavefront of the light is :

(A) both spherical and cylindrical
(B) plane
(C) spherical
(D) cylindrical

Answer: (B) plane · Key from source paper

Q48 JEE Main 2024 · 5 Apr · Shift 1 Numerical

In Young's double slit experiment, carried out with light of wavelength $5000\ \text{Å}$, the distance between the slits is 0.3 mm and the screen is at 200 cm from the slits. The central maximum is at x = 0 cm. The value of x for third maxima is _____ mm.

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q49 JEE Main 2024 · 5 Apr · Shift 2 Numerical

In a single slit experiment, a parallel beam of green light of wavelength 550 nm passes through a slit of width 0.20 mm. The transmitted light is collected on a screen 100 cm away. The distance of first order minima from the central maximum will be $x \times 10^{-5}$ m. The value of x is :

Numerical value type: the answer is a number.

Answer: 275. · Key from source paper

Q50 JEE Main 2024 · 4 Apr · Shift 1 Numerical

Two wavelengths λ_1 and λ_2 are used in Young's double slit experiment. λ_1 = 450 nm and λ_2 = 650 nm. The minimum order of fringe produced by λ_2 which overlaps with the fringe produced by λ_1 is n. The value of n is _____.

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q51 JEE Main 2024 · 4 Apr · Shift 2 MCQ

The width of one of the two slits in a Young's double slit experiment is 4 times that of the other slit. The ratio of the maximum of the minimum intensity in the interference pattern is:

(A) 1 : 1
(B) 4 : 1
(C) 9 : 1
(D) 16 : 1

Answer: (C) 9 : 1 · Key from source paper

Q52 JEE Main 2024 · 1 Feb · Shift 1 MCQ

A monochromatic light of wavelength 6000 $\mathring{A}$ is incident on the single slit of width 0.01 mm. If the diffraction pattern is formed at the focus of the convex lens of focal length 20 cm, the linear width of the central maximum is :

(A) 60 mm
(B) 24 mm
(C) 120 mm
(D) 12 mm

Answer: (B) 24 mm · Key from source paper

Q53 JEE Main 2024 · 1 Feb · Shift 2 MCQ

A microwave of wavelength 2.0 cm falls normally on a slit of width 4.0 cm. The angular spread of the central maxima of the diffraction pattern obtained on a screen 1.5 m away from the slit, will be:

(A) 30°
(B) 15°
(C) 60°
(D) 45°

Answer: (C) 60° · Key from source paper

Q54 JEE Main 2024 · 1 Feb · Shift 2 Numerical

In Young's double slit experiment, monochromatic light of wavelength 5000 $\mathring{A}$ is used. The slits are 1.0 mm apart and screen is placed at 1.0 m away from slits. The distance from the centre of the screen where intensity becomes half of the maximum intensity for the first time is _____ $\times 10^{-6}$ m.

Numerical value type: the answer is a number.

Answer: 125. · Key from source paper

Q55 JEE Main 2024 · 31 Jan · Shift 1 Numerical

Two waves of intensity ratio 1 : 9 cross each other at a point. The resultant intensities at the point, when (a) Waves are incoherent is I_1 b Waves are coherent is I_2 and differ in phase by 60°. If $\frac{I_1}{I_2} = \frac{10}{x}$, then $x =$ _____.

Numerical value type: the answer is a number.

Answer: 13. · Key from source paper

Q56 JEE Main 2024 · 31 Jan · Shift 2 MCQ

When unpolarized light is incident at an angle of 60° on a transparent medium from air. The reflected ray is completely polarized. The angle of refraction in the medium is

(A) 30°
(B) 60°
(C) 90°
(D) 45°

Answer: (A) 30° · Key from source paper

Q57 JEE Main 2024 · 30 Jan · Shift 1 MCQ

The diffraction pattern of a light of wavelength 400 nm diffracting from a slit of width 0. 2 mm is focused on the focal plane of a convex lens of focal length 100 cm. The width of the 1st secondary maxima will be :

(A) 2 mm
(B) 2 cm
(C) 02 mm
(D) 2 mm

Answer: (A) 2 mm · Key from source paper

Q58 JEE Main 2024 · 30 Jan · Shift 2 MCQ

A beam of unpolarised light of intensity I_0 is passed through a polaroid A and then through another polaroid B which is oriented so that its principal plane makes an angle of 45° relative to that of A. The intensity of emergent light is :

(A) $\frac{I_0}{4}$
(B) I_0
(C) $\frac{I_0}{2}$
(D) $\frac{I_0}{8}$

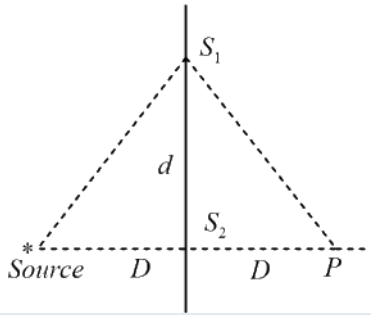
Answer: (A) $\frac{I_0}{4}$ · Key from source paper

Q59 JEE Main 2024 · 29 Jan · Shift 1 Numerical

In a double slit experiment shown in figure, when light of wavelength 400 nm is used, dark fringe is observed at P. If $D = 0.2$ m, the minimum distance between the slits S_1 and S_2 is α mm. Write the value of 10α to the nearest integer.

(see the figure above)

Q29. In a double slit experiment shown in figure, when light of wavelength 400 nm is used, dark fringe is observed at P. If $D = 0.2$ m, the minimum distance between the slits S_1 and S_2 is α mm. Write the value of 10α to the nearest integer.



Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q60 JEE Main 2024 · 29 Jan · Shift 2 MCQ

In Young's double slit experiment, light from two identical sources are superimposing on a screen. The path difference between the two lights reaching at a point on the screen is $\frac{7\lambda}{4}$. The ratio of intensity of fringe at this point with respect to the maximum intensity of the fringe is:

(A) $\frac{1}{2}$
(B) $\frac{3}{4}$
(C) $\frac{1}{3}$
(D) $\frac{1}{4}$

Answer: (A) $\frac{1}{2}$ · Key from source paper

Q61 JEE Main 2024 · 29 Jan · Shift 2 Numerical

In a single slit diffraction pattern, a light of wavelength 6000 Å is used. The distance between the first and third minima in the diffraction pattern is found to be 3 mm when the screen is placed 50 cm away from slits. The width of the slit is _____ $\times 10^{-4}$ m.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q62 JEE Main 2024 · 27 Jan · Shift 2 MCQ

When a polaroid sheet is rotated between two crossed polaroids then the transmitted light intensity will be maximum for a rotation of :

(A) 60°
(B) 30°
(C) 90°
(D) 45°

Answer: (D) 45° · Key from source paper

Q63 JEE Main 2024 · 27 Jan · Shift 2 Numerical

A parallel beam of monochromatic light of wavelength 5000 Å is incident normally on a single narrow slit of width 0.001 mm. The light is focused by convex lens on screen, placed on its focal plane. The first minima will be formed for the angle of diffraction of _____ (degree).

Numerical value type: the answer is a number.

Answer: 30. · Key from source paper

Q64 JEE Main 2023 · 15 Apr · Shift 1 MCQ

A single slit of width a is illuminated by a monochromatic light of wavelength 600 nm. The value of a for which first minimum appears at $\theta = 30°$ on the screen will be :

(A) 1.2 μm
(B) 3 μm
(C) 1.8 μm
(D) 0.6 μm

Answer: (A) 1.2 μm · Key from source paper

Q65 JEE Main 2023 · 13 Apr · Shift 2 MCQ

In a Young's double slit experiment, the ratio of amplitude of light coming from slits is 2 : 1. The ratio of the maximum to minimum intensity in the interference pattern is

(A) 9 : 4
(B) 25 : 9
(C) 2 : 1
(D) 9 : 1

Answer: (D) 9 : 1 · Key from source paper

Q66 JEE Main 2023 · 10 Apr · Shift 1 Numerical

Unpolarised light of intensity $32\ \mathrm{W\,m^{-2}}$ passes through the combination of three polaroids such that the pass axis of the last polaroids is perpendicular to that of the pass axis of first polaroids. If intensity of emerging light is $3\ \mathrm{W\,m^{-2}}$, then the angle between pass axis of first two polaroids is _____ °.

Numerical value type: the answer is a number.

Answer: 30. · Key from source paper

Q67 JEE Main 2023 · 10 Apr · Shift 2 MCQ

The ratio of intensities at two points P and Q on the screen in a Young's double slit experiment where phase difference between two waves of same amplitude are $\frac{\pi}{3}$ and $\frac{\pi}{2}$, respectively are

(A) $2 : 3$
(B) $1 : 3$
(C) $3 : 1$
(D) $3 : 2$

Answer: (D) $3 : 2$ · Key from source paper

Q68 JEE Main 2023 · 8 Apr · Shift 2 MCQ

The width of fringe is $2\ \text{mm}$ on the screen in a double slit experiment for the light of wavelength of $400\ \text{nm}$. The width of the fringe for the light of wavelength $600\ \text{nm}$ will be:

(A) $4\ \text{mm}$
(B) $2\ \text{mm}$
(C) $1.33\ \text{mm}$
(D) $3\ \text{mm}$

Answer: (D) $3\ \text{mm}$ · Key from source paper

Q69 JEE Main 2023 · 6 Apr · Shift 2 MCQ

Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A: The phase difference of two light waves change if they travel through different media having same thickness, but different indices of refraction.

Reason R: The wavelengths of waves are different in different media.

In the light of the above statements, choose the most appropriate answer from the options given below

(A) Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**
(B) **A** is not correct but **R** is correct
(C) **A** is correct but **R** is not correct
(D) Both **A** and **R** are correct and **R** is the correct explanation of **A**

Answer: (D) Both A and R are correct and R is the correct explanation of A · Key from source paper

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Q70 JEE Main 2023 · 6 Apr · Shift 2 Numerical

A beam of light consisting of two wavelengths $7000\ \text{Å}$ and $5500\ \text{Å}$ is used to obtain interference pattern in Young's double slit experiment. The distance between the slits is $2.5\ \text{mm}$ and the distance between the plane of slits and the screen is $150\ \text{cm}$. The least distance from the central fringe, where the bright fringes due to both the wavelengths coincide, is $n \times 10^{-5}\ \text{m}$. The value of n is _____ .

Numerical value type: the answer is a number.

Answer: 462. · Key from source paper

Q71 JEE Main 2023 · 1 Feb · Shift 1 MCQ

'n' polarizing sheets are arranged such that each makes an angle 45° with the proceeding sheet. An unpolarized light of intensity I is incident into this arrangement. The output intensity is found to be $\frac{I}{64}$. The value of n will be:

(A) 3
(B) 6
(C) 5
(D) 4

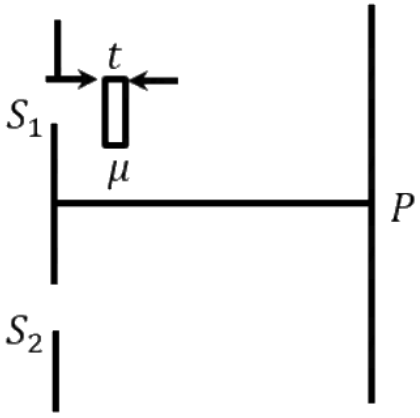
Answer: (B) 6 · Key from source paper

Q72 JEE Main 2023 · 1 Feb · Shift 2 Numerical

As shown in the figure, in Young's double slit experiment, a thin plate of thickness t = 10 μm and refractive index μ = 1.2 is inserted infront of slit S_1. The experiment is conducted in air (μ = 1) and uses a monochromatic light of wavelength λ = 500 nm. Due to the insertion of the plate, central maxima is shifted by a distance of $x\beta_0$. β_0 is the fringe-width before the insertion of the plate. The value of the x is _____.

(see the figure above)

Q25. As shown in the figure, in Young's double slit experiment, a thin plate of thickness $t = 10$ μm and refractive index $\mu = 1.2$ is inserted infront of slit S_1. The experiment is conducted in air $(\mu = 1)$ and uses a monochromatic light of wavelength $\lambda = 500$ nm. Due to the insertion of the plate, central maxima is shifted by a distance of $x\beta_0$. β_0 is the fringe-width before the insertion of the plate. The value of the x is _____.



Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q73 JEE Main 2023 · 31 Jan · Shift 1 MCQ

Two polaroids A and B are placed in such a way that the pass-axis of polaroids are perpendicular to each other. Now, another polaroid C is placed between A and B bisecting angle between them. If intensity of unpolarised light is I_0 then intensity of transmitted light after passing through polaroid B will be :

(A) $\frac{I_0}{4}$
(B) $\frac{I_0}{2}$
(C) $\frac{I_0}{8}$
(D) Zero

Answer: (C) $\frac{I_0}{8}$ · Key from source paper

Q74 JEE Main 2023 · 31 Jan · Shift 2 Numerical

Two light waves of wavelengths 800 and 600 nm are used in Young's double slit experiment to obtain interference fringes on a screen placed 7 m away from plane of slits. If the two slits are separated by 0.35 mm, then shortest distance from the central bright maximum to the point where the bright fringes of the two wavelength coincide will be _____ mm.

Numerical value type: the answer is a number.

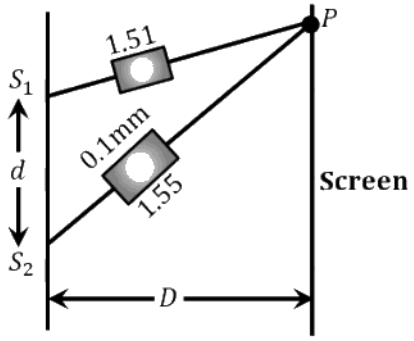
Answer: 48. · Key from source paper

Q75 JEE Main 2023 · 30 Jan · Shift 1 Numerical

In Young's double slit experiment, two slits S_1 and S_2 are d distance apart and the separation from slits to screen is D (as shown in figure). Now if two transparent slabs of equal thickness 0.1 mm but refractive index 1.51 and 1.55 are introduced in the path of beam λ = 4000 Å from S_1 and S_2 respectively. The central bright fringe spot will shift by _____ number of fringes.

(see the figure above)

Q28. In Young's double slit experiment, two slits S_1 and S_2 are d distance apart and the separation from slits to screen is D (as shown in figure). Now if two transparent slabs of equal thickness 0.1 mm but refractive index 1.51 and 1.55 are introduced in the path of beam $\lambda = 4000$ Å from S_1 and S_2 respectively. The central bright fringe spot will shift by _____ number of fringes.



Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q76 JEE Main 2023 · 30 Jan · Shift 2 Numerical

In a Young's double slit experiment, the intensities at two points, for the path difference $\frac{\lambda}{4}$ and $\frac{\lambda}{3}$ (λ being the wavelength of light used) are I_1 and I_2 respectively. If I_0 denotes the intensity produced by each one of the individual slits, then $\frac{I_1+I_2}{I_0}$ = _____.

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

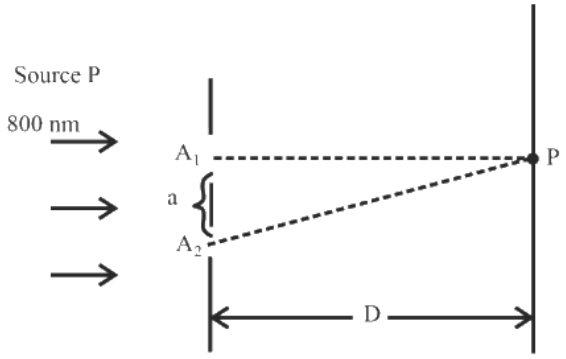
Q77 JEE Main 2023 · 29 Jan · Shift 1 MCQ

In a Young's double slit experiment, two slits are illuminated with a light of wavelength $800\ \text{nm}$. The line joining A_1P is perpendicular to A_1A_2 as shown in the figure. If the first minimum is detected at P , the value of slits separation a will be :

(see the figure above)

The distance of screen from slits $D = 5\ \text{cm}$.

Q23. In a Young's double slit experiment, two slits are illuminated with a light of wavelength 800 nm. The line joining A_1P is perpendicular to A_1A_2 as shown in the figure. If the first minimum is detected at P, the value of slits separation a will be :



The distance of screen from slits $D = 5\ \text{cm}$.

(1) $0.4\ \text{mm}$ (2) $0.5\ \text{mm}$

(3) $0.2\ \text{mm}$ (4) $0.1\ \text{mm}$

(A) $0.4\ \text{mm}$

(B) $0.5\ \text{mm}$

(C) $0.2\ \text{mm}$

(D) $0.1\ \text{mm}$

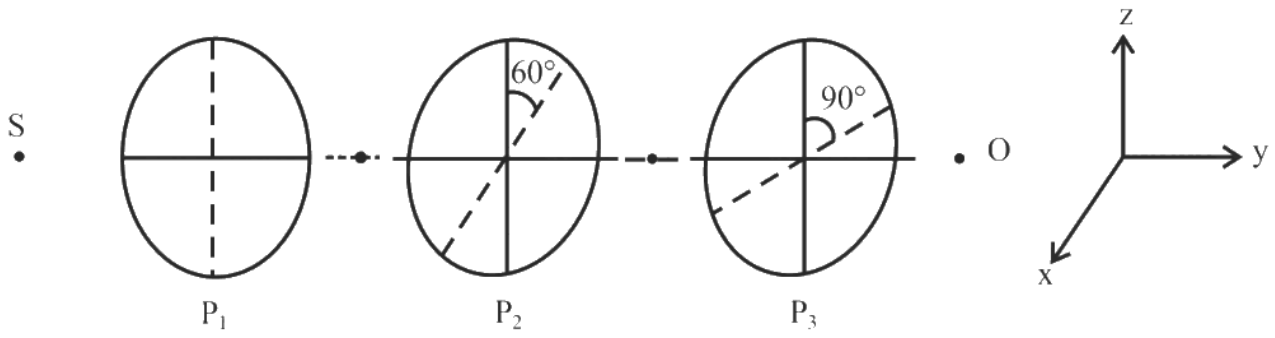
Answer: (C) $0.2\ \text{mm}$ · Key from source paper

Q78 JEE Main 2023 · 29 Jan · Shift 1 Numerical

As shown in figures, three identical polaroids P_1, P_2 and P_3 are placed one after another. The pass axis of P_2 and P_3 are inclined at angle of 60° and 90° with respect to axis of P_1. The source S has an intensity of $256\ \text{W m}^{-2}$. The intensity of light at point O is _____ W m^{-2}.

(see the figure above)

Q24. As shown in figures, three identical polaroids P_1, P_2 and P_3 are placed one after another. The pass axis of P_2 and P_3 are inclined at angle of 60° and 90° with respect to axis of P_1. The source S has an intensity of $256\ \mathrm{W\ m^{-2}}$. The intensity of light at point O is _____ $\mathrm{W\ m^{-2}}$.



Numerical value type: the answer is a number.

Answer: 24. · Key from source paper

Q79 JEE Main 2023 · 29 Jan · Shift 2 Numerical

Unpolarised light is incident on the boundary between two dielectric media, whose dielectric constants are 2.8 (medium -1) and 6.8 (medium - 2), respectively. To satisfy the condition, so that the reflected and refracted rays are perpendicular to each other, the angle of incidence should be $\tan^{-1}\left(1+\frac{10}{\theta}\right)^{\frac{1}{2}}$, the value of θ is _____.
(Given for dielectric media, $\mu_r = 1$)

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q80 JEE Main 2023 · 25 Jan · Shift 1 MCQ

In Young's double slits experiment, the position of 5th bright fringe from the central maximum is 5 cm. The distance between slits and screen is 1 m and wavelength of used monochromatic light is 600 nm. The separation between the slits is:

(A) $60\ \mu\mathrm{m}$
(B) $48\ \mu\mathrm{m}$
(C) $12\ \mu\mathrm{m}$
(D) $36\ \mu\mathrm{m}$

Answer: (A) $60\ \mu\mathrm{m}$ · Key from source paper

Q81 JEE Main 2023 · 24 Jan · Shift 1 MCQ

Given below are two statements :

Statement I : If the Brewster's angle for the light propagating from air to glass is θ_B, then Brewster's angle for the light propagating from glass to air is $\frac{\pi}{2} - \theta_B$.

Statement II : The Brewster's angle for the light propagating from glass to air is $\tan^{-1}\mu_g$, where μ_g is the refractive index of glass.

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

(A) Both Statements I and Statement II are true.

(B) Statement I is true but Statement II is false.

(C) Both Statement I and Statement II are false.

(D) Statement I is false but Statement II is true.

Answer: (B) Statement I is true but Statement II is false. · Key from source paper

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Q82 JEE Main 2022 · 29 Jul · Shift 1 Numerical

Two light beams of intensities $4I$ and $9I$ interfere on a screen. The phase difference between these beams on the screen at point A is zero and at point B is π. The difference of resultant intensities, at the point A and B, will be _____ I.

Numerical value type: the answer is a number.

Answer: 24. · Key from source paper

Q83 JEE Main 2022 · 29 Jul · Shift 2 MCQ

An unpolarised light beam of intensity $2I_0$ is passed through a polaroid P and then through another polaroid Q which is oriented in such a way that its passing axis makes an angle of 30° relative to that of P. The intensity of the emergent light is

(A) $\frac{I_0}{4}$

(B) $\frac{I_0}{2}$

(C) $\frac{3I_0}{4}$

(D) $\frac{3I_0}{2}$

Answer: (C) $\frac{3I_0}{4}$ · Key from source paper

Q84 JEE Main 2022 · 28 Jul · Shift 1 Numerical

In a Young's double slit experiment, a laser light of $560\ \text{nm}$ produces an interference pattern with consecutive bright fringes' separation of $7.2\ \text{mm}$. Now another light is used to produce an interference pattern with consecutive bright fringes' separation of $8.1\ \text{mm}$. The wavelength of second light is _____ nm.

Numerical value type: the answer is a number.

Answer: 630. · Key from source paper

Q85 JEE Main 2022 · 27 Jul · Shift 1 Numerical

Two beams of light having intensities I and $4I$ interfere to produce a fringe pattern on a screen. The phase difference between the two beams are $\frac{\pi}{2}$ and $\frac{\pi}{3}$ at points A and B respectively. The difference

between the resultant intensities at the two points is xI. The value of x will be _____ .

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q86 JEE Main 2022 · 27 Jul · Shift 2 MCQ

Two coherent sources of light interfere. The intensity ratio of two sources is 1 : 4. For this interference pattern if the value of $\frac{I_{max}+I_{min}}{I_{max}-I_{min}}$ is equal to $\frac{2\alpha+1}{\beta+3}$, then $\frac{\alpha}{\beta}$ will be

(A) 1.5
(B) 2
(C) 0.5
(D) 1

Answer: (B) 2 · Key from source paper

Q87 JEE Main 2022 · 26 Jul · Shift 1 MCQ

In young's double slit experiment, the fringe width is 12 mm. If the entire arrangement is placed in water of refractive index $\frac{4}{3}$, then the fringe width becomes (in mm)

(A) 16
(B) 9
(C) 48
(D) 12

Answer: (B) 9 · Key from source paper

Q88 JEE Main 2022 · 29 Jun · Shift 1 MCQ

Using Young's double slit experiment, a monochromatic light of wavelength 5000Å produces fringes of fringe width $0.5\ \text{mm}$. If another monochromatic light of wavelength 6000Å is used and the separation between the slits is doubled, then the new fringe width will be

(A) $0.5\ \text{mm}$
(B) $1.0\ \text{mm}$
(C) $0.6\ \text{mm}$
(D) $0.3\ \text{mm}$

Answer: (D) $0.3\ \text{mm}$ · Key from source paper

Q89 JEE Main 2022 · 29 Jun · Shift 2 Numerical

In a double slit experiment with monochromatic light, fringes are obtained on a screen placed at some distance from the plane of slits. If the screen is moved by $5 \times 10^{-2}\ \text{m}$ towards the slits, the change in fringe width is $3 \times 10^{-3}\ \text{cm}$. If the distance between the slits is $1\ \text{mm}$, then the wavelength of the light will be _____ nm.

Numerical value type: the answer is a number.

Answer: 600. · Key from source paper

Q90 JEE Main 2022 · 28 Jun · Shift 2 MCQ

In young's double slit experiment performed using a monochromatic light of wavelength λ, when a glass plate ($\mu = 1.5$) of thickness $x\lambda$ is introduced in the path of the one of the interfering beams, the intensity at the position where the central maximum occurred previously remains unchanged. The value of x will be

(A) 3
(B) 2
(C) 1.5
(D) 0.5

Answer: (B) 2 · Key from source paper

Q91 JEE Main 2022 · 28 Jun · Shift 2 Numerical

In a Young's double slit experiment, an angular width of the fringe is 0.35° on a screen placed at $2\ \mathrm{m}$ away for particular wavelength of $450\ \mathrm{nm}$. The angular width of the fringe, when whole system is immersed in a medium of refractive index $\frac{7}{5}$, is $\frac{1}{\alpha}$. The value of α is _____ .

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q92 JEE Main 2022 · 27 Jun · Shift 1 Numerical

In Young's double slit experiment the two slits are $0.6\ \mathrm{mm}$ distance apart. Interference pattern is observed on a screen at a distance $80\ \mathrm{cm}$ from the slits. The first dark fringe is observed on the screen directly opposite to one of the slits. The wavelength of light will be _____ nm.

Numerical value type: the answer is a number.

Answer: 450. · Key from source paper

Q93 JEE Main 2022 · 25 Jun · Shift 1 MCQ

The two light beams having intensities I and $9I$ interfere to produce a fringe pattern on a screen. The phase difference between the beams is $\frac{\pi}{2}$ at point P and π at point Q. Then the difference between the resultant intensities at P and Q will be :

(A) $2I$
(B) $6I$
(C) $5I$
(D) $7I$

Answer: (B) $6I$ · Key from source paper

Q94 JEE Main 2022 · 25 Jun · Shift 2 MCQ

The interference pattern is obtained with two coherent light sources of intensity ratio $4:1$. And the ratio $\frac{I_{\max}+I_{\min}}{I_{\max}-I_{\min}}$ is $\frac{5}{x}$. Then, the value of x will be equal to :

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

Answer: (B) 4 · Key from source paper

Q95 JEE Main 2022 · 25 Jun · Shift 2 MCQ

A light whose electric field vectors are completely removed by using a good polaroid, allowed to incident on the surface of the prism at Brewster's angle. Choose the most suitable option for the phenomenon related to the prism.

(A) Reflected and refracted rays will be perpendicular to each other.
(B) Wave will propagate along the surface of prism.
(C) No refraction, and there will be total reflection of light.
(D) No reflection. and there will be total transmission of light.

Answer: (D) No reflection. and there will be total transmission of light. · Key from source paper

Q96 JEE Main 2022 · 24 Jun · Shift 1 Numerical

Sodium light of wavelengths $650\ \text{nm}$ and $655\ \text{nm}$ is used to study diffraction at a single slit of aperture $0.5\ \text{mm}$. The distance between the slit and the screen is $2.0\ \text{m}$. The separation between the positions of the first maxima of diffraction pattern obtained in the two cases is _____ $\times 10^{-5}\ \text{m}$

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q97 JEE Main 2022 · 24 Jun · Shift 2 MCQ

Two light beams of intensities in the ratio of $9:4$ are allowed to interfere. The ratio of the intensity of maxima and minima will be :

(A) $9:4$
(B) $16:81$
(C) $25:169$
(D) $25:1$

Answer: (D) $25:1$ · Key from source paper

Q98 JEE Main 2021 · 1 Sep · Shift 2 Numerical

The width of one of the two slits in a Young's double slit experiment is three times the other slit. If the amplitude of the light coming from a slit is proportional to the slit-width, the ratio of minimum to maximum intensity in the interference pattern is $x : 4$ where x is _____.

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q99 JEE Main 2021 · 31 Aug · Shift 2 Numerical

In a Young's double slit experiment, the slits are separated by 0.3 mm and the screen is 1.5 m away from the plane of slits. Distance between fourth bright fringes on both sides of central bright fringe is 2.4 cm. The frequency of light used is $x \times 10^{14}$ Hz.

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q100 JEE Main 2021 · 27 Aug · Shift 2 MCQ

The light waves from two coherent sources have same intensity $I_1 = I_2 = I_0$. In interference pattern the intensity of light at minima is zero. What will be the intensity of light at maxima?

(A) I_0
(B) $2I_0$
(C) $4I_0$
(D) $5I_0$

Answer: (C) $4I_0$ · Key from source paper

Q101 JEE Main 2021 · 26 Aug · Shift 1 Numerical

White light is passed through a double slit and interference is observed on a screen $1.5\ \mathrm{m}$ away. The separation between the slits is $0.3\ \mathrm{mm}$. The first violet and red fringes are formed $2.0\ \mathrm{mm}$ and $3.5\ \mathrm{mm}$ away from the central white fringes. The difference in wavelengths of red and violet light is (in nm).

Numerical value type: the answer is a number.

Answer: 300. · Key from source paper

Q102 JEE Main 2021 · 26 Aug · Shift 2 Numerical

A source of light is placed in front of a screen. The intensity of light on the screen is I. Two Polaroids P_1 and P_2 are so placed in between the source of light and screen that the intensity of light on the screen is $\frac{I}{2}$. Then the P_2, should be rotated by an angle of (degrees) so that the intensity of light on the screen becomes $\frac{3I}{8}$.

Numerical value type: the answer is a number.

Answer: 30. · Key from source paper

Q103 JEE Main 2021 · 27 Jul · Shift 1 MCQ

In Young's double slit experiment, if the source of light changes from orange to blue then:

(A) the central bright fringe will become a dark fringe.
(B) the distance between consecutive fringes will decrease.
(C) the distance between consecutive fringes will increase.
(D) the intensity of the minima will increase.

Answer: (B) the distance between consecutive fringes will decrease. · Key from source paper

Q104 JEE Main 2021 · 27 Jul · Shift 2 Numerical

The difference in the number of waves when yellow light propagates through air and vacuum columns of the same thickness is one. The thickness of the air column is _____ mm. [Refractive index of air $= 1.0003$, the wavelength of yellow light in vacuum $= 6000\ \text{Å}$]

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q105 JEE Main 2021 · 25 Jul · Shift 1 MCQ

In the Young's double slit experiment, the distance between the slits varies in time as $dt = d_0 + a_0 \sin \omega t$; where d_0, ω and a_0 are constants. The difference between the largest fringe width and the smallest fringe width obtained over time is given as:

(A) $\frac{2\lambda D d_0}{d_0^2 - a_0^2}$
(B) $\frac{2\lambda D a_0}{d_0^2 - a_0^2}$
(C) $\frac{\lambda D}{d_0^2} a_0$
(D) $\frac{\lambda D}{d_0 + a_0}$

Answer: (B) $\frac{2\lambda D a_0}{d_0^2 - a_0^2}$ · Key from source paper

Q106 JEE Main 2021 · 18 Mar · Shift 1 MCQ

In Young's double slit arrangement, slits are separated by a gap of $0.5\ \text{mm}$, and the screen is placed at a distance of $0.5\ \text{m}$ from them. The distance between the first and the third bright fringe formed when the slits are illuminated by a monochromatic light of $5890\ \text{Å}$ is :-

(A) 1178×10^{-9} m
(B) 1178×10^{-6} m
(C) 1178×10^{-12} m
(D) 5890×10^{-7} m

Answer: (B) 1178×10^{-6} m · Key from source paper

Q107 JEE Main 2021 · 16 Mar · Shift 1 Numerical

A fringe width of 6 mm was produced for two slits separated by 1 mm apart. The screen is placed 10 m away. The wavelength of light used is x nm. The value of x to the nearest integer is _____.

Numerical value type: the answer is a number.

Answer: 600. · Key from source paper

Q108 JEE Main 2021 · 26 Feb · Shift 1 MCQ

In a Young's double slit experiment two slits are separated by 2 mm and the screen is placed one meter away. When a light of wavelength 500 nm is used, the fringe separation will be :

(A) 1 mm
(B) 0.50 mm
(C) 0.75 mm
(D) 0.25 mm

Answer: (D) 0.25 mm · Key from source paper

Q109 JEE Main 2021 · 25 Feb · Shift 1 MCQ

Two coherent light sources having intensity in the ratio $2x$ produce an interference pattern. The ratio $\frac{I_{max}-I_{min}}{I_{max}+I_{min}}$ will be

(A) $\frac{2\sqrt{2x}}{x+1}$
(B) $\frac{\sqrt{2x}}{2x+1}$
(C) $\frac{2\sqrt{2x}}{2x+1}$
(D) $\frac{\sqrt{2x}}{x+1}$

Answer: (C) $\frac{2\sqrt{2x}}{2x+1}$ · Key from source paper

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Q110 JEE Main 2021 · 25 Feb · Shift 2 MCQ

Consider the diffraction pattern obtained from the sunlight incident on a pinhole of diameter 0.1 μm. If the diameter of the pinhole is slightly increased, it will affect the diffraction pattern such that

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(A) its size increases, and intensity increases
(B) its size decreases, and intensity decreases
(C) its size decreases, but intensity increases
(D) its size increases, but intensity decreases

Answer: (C) its size decreases, but intensity increases · Key from source paper

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Q111 JEE Main 2021 · 24 Feb · Shift 1 MCQ

In a Young's double slit experiment, the width of the one of the slit is three times the other slit. The amplitude of the light coming from a slit is proportional to the slit-width. Find the ratio of the maximum to the minimum intensity in the interference pattern.

(A) $1:4$
(B) $2:1$
(C) $3:1$
(D) $4:1$

Answer: (D) $4:1$ · Key from source paper

Q112 JEE Main 2021 · 24 Feb · Shift 1 Numerical

An unpolarized light beam is incident on the polarizer of a polarization experiment and the intensity of light beam emerging from the analyzer is measured as 100 Lumens. Now, if the analyzer is rotated around the horizontal axis (direction of light) by 30° in clockwise direction, the intensity of emerging light will be _____ Lumens.

Numerical value type: the answer is a number.

Answer: 75. · Key from source paper

Q113 JEE Main 2021 · 24 Feb · Shift 2 MCQ

If the source of light used in a Young's double slit experiment is changed from red to violet:

(A) consecutive fringe lines will come closer.
(B) the fringes will become brighter.
(C) the central bright fringe will become a dark fringe.
(D) the intensity of minima will increase.

Answer: (A) consecutive fringe lines will come closer. · Key from source paper

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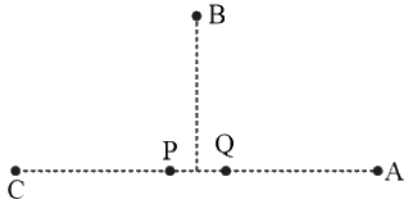
Q114 JEE Main 2020 · 6 Sep · Shift 1 MCQ

In the figure below, P and Q are two equally intense coherent sources emitting radiation of wavelength 20m. The separation between P and Q is 5m and the phase of P is ahead of that of Q by 90°. A, B and C are three distinct point of observation, each equidistant from the midpoint of PQ. The

intensities of radiation at A, B, C will be in the ratio :
(see the figure above)

Q16. In the figure below, P and Q are two equally intense coherent sources emitting radiation of wavelength 20m. The separation between P and Q is 5m and the phase of P is ahead of that of Q by 90°. A, B and C are three distinct point of observation, each equidistant from the midpoint of PQ. The intensities of radiation at A, B, C will be in the ratio :



(1) $0:1:4$ (2) $2:1:0$
(3) $0:1:2$ (4) $4:1:0$

(A) $0:1:4$
(B) $2:1:0$
(C) $0:1:2$
(D) $4:1:0$

Answer: (B) $2:1:0$ · Key from source paper

Q115 JEE Main 2020 · 6 Sep · Shift 2 Numerical

A Young's double-slit experiment is performed 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 $\frac{\lambda}{6}$ is given by $\frac{nK}{12}$, where n is an integer. The value of n is

Numerical value type: the answer is a number.

Answer: 9. · Key from source paper

Q116 JEE Main 2020 · 4 Sep · Shift 1 MCQ

A beam of plane polarized light of large cross-sectional area and uniform intensity of $3.3\ \mathrm{W\ m^{-2}}$ falls normally on a polarizer (cross-sectional area $3 \times 10^{-4}\ \mathrm{m^2}$), which rotates about its axis with an angular speed of $31.4\ \mathrm{rad\ s^{-1}}$. The energy of light passing through the polarizer per revolution, is close to:

(A) $1.0 \times 10^{-5}\ \mathrm{J}$
(B) $1.0 \times 10^{-4}\ \mathrm{J}$
(C) $1.5 \times 10^{-4}\ \mathrm{J}$
(D) $5.0 \times 10^{-4}\ \mathrm{J}$

Answer: (B) $1.0 \times 10^{-4}\ \mathrm{J}$ · Key from source paper

Q117 JEE Main 2020 · 4 Sep · Shift 2 Numerical

Orange light of wavelength $6000 \times 10^{-10}\ m$ illuminates a single slit of width $0.6 \times 10^{-4}\ m$. The maximum possible number of diffraction minima produced on both sides of the central maximum is _____

Numerical value type: the answer is a number.

Accepted answers: 200 or 198. · Key from source paper

Q118 JEE Main 2020 · 3 Sep · Shift 1 MCQ

In a Young's double slit experiment, light of $500\ \text{nm}$ is used to produce and interference pattern. When the distance between the slits is $0.05\ \text{mm}$, the angular width (in degree) of the fringes formed on the distance screen is close to :

(A) 0.17°
(B) 0.57°
(C) 1.7°
(D) 0.07°

Answer: (B) 0.57° · Key from source paper

Q119 JEE Main 2020 · 3 Sep · Shift 2 MCQ

Two light waves having the same wavelength λ in vacuum are in phase initially. Then the first wave travels a path L_1 through a medium of refractive index n_1 while the second wave travels a path of length L_2 through a medium of refractive index n_2. After this the phase difference between the two waves is:

(A) $\frac{2\pi}{\lambda}\left(\frac{L_2}{n_1} - \frac{L_1}{n_2}\right)$
(B) $\frac{2\pi}{\lambda}\left(\frac{L_1}{n_1} - \frac{L_2}{n_2}\right)$
(C) $\frac{2\pi}{\lambda}(n_1L_1 - n_2L_2)$
(D) $\frac{2\pi}{\lambda}(n_2L_1 - n_1L_2)$

Answer: (C) $\frac{2\pi}{\lambda}(n_1L_1 - n_2L_2)$ · Key from source paper

Q120 JEE Main 2020 · 2 Sep · Shift 1 MCQ

Interference fringes are observed on a screen by illuminating two thin slits $1\ \text{mm}$ apart with a light source ($\lambda = 632.8\ \text{nm}$). The distance between the screen and the slits is $100\ \text{cm}$. If a bright fringe is observed on a screen at distance of $1.27\ \text{mm}$ from the central bright fringe, then the path difference between the waves, which are reaching this point from the slits is close to :

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(A) $1.27\mu\text{m}$
(B) $2.87\ \text{nm}$
(C) $2\ \text{nm}$
(D) $2.05\ \mu\text{m}$

Answer: (A) $1.27\mu\text{m}$ · Key from source paper

Q121 JEE Main 2020 · 2 Sep · Shift 2 MCQ

In a Young's double slit experiment,16 fringes are observed in a certain segment of the screen when light of wavelength $700\ \text{nm}$ is used. If the wavelength of light is changed to $400\ \text{nm}$, the number of fringes observed in the same segment of the screen would be :

(A) 24
(B) 30
(C) 18
(D) 28

Answer: (D) 28 · Key from source paper

Q122 JEE Main 2020 · 9 Jan · Shift 1 MCQ

The aperture diameter of a telescope is 5m . The separation between the moon and the earth is $4 \times 10^5\text{km}$. With light of wavelength of 5500Å , the minimum separation between objects on the surface of moon, so that they are just resolved, is close to:

(A) 60m
(B) 20m
(C) 200m
(D) 600m

Answer: (A) 60m · Key from source paper

Q123 JEE Main 2020 · 9 Jan · Shift 2 Numerical

In Young's double slit experiment 15 fringes are observed on a small portion of the screen when light of wavelength 500 nm is used. Ten fringes are observed on the same section of the screen when another light source of wavelength λ is used. Then the value of λ is (in nm) _____.

Numerical value type: the answer is a number.

Answer: 750. · Key from source paper

Q124 JEE Main 2020 · 8 Jan · Shift 2 MCQ

In a double $-$ slit experiment, at a certain point on the screen the path difference between the two interfering waves is $\frac{1}{8}$th of a wavelength. The ratio of the intensity of light at that point to that at the center of a bright fringe is:

(A) 0.853
(B) 0.672
(C) 0.568
(D) 0.760

Answer: (A) 0.853 · Key from source paper

Q125 JEE Main 2020 · 7 Jan · Shift 1 MCQ

A polarizer - analyser set is adjusted such that the intensity of light coming out of the analyser is just 36% of the original intensity. Assuming that the polarizer - analyser set does not absorb any light, the angle by which the analyser needs to be rotated further, to reduce the output intensity to zero, is $\left(\sin^{-1}\left(\frac{3}{5}\right) = 37^\circ\right)$

(A) 53°
(B) 37°
(C) 90°
(D) 45°

Answer: (B) 37° · Key from source paper

Q126 JEE Main 2020 · 7 Jan · Shift 1 MCQ

Visible light of wavelength $6000 \times 10^{-8}\text{cm}$ falls normally on a single slit and produces a diffraction pattern. It is found that the second diffraction minimum is at 60° from the central maximum. If the first minimum is produced at θ_1, then θ_1 is close to

(A) 20°
(B) 30°
(C) 25°
(D) 45°

Answer: (C) 25° · Key from source paper

Q127 JEE Main 2020 · 7 Jan · Shift 2 MCQ

In a Young's double slit experiment, the separation between the slits is 0.15mm. In the experiment, a source of light of wavelength 589nm is used and the interference pattern is observed on a screen kept 1.5m away. The separation between the successive bright fringes on the screen is:

(A) 6.9mm
(B) 3.9mm
(C) 5.9mm
(D) 4.9mm

Answer: (C) 5.9mm · Key from source paper

Q128 JEE Main 2019 · 12 Apr · Shift 1 MCQ

In a double slit experiment, when a thin film of thickness t having refractive index μ is introuduced in front of one of the slits, the maximum at the centre of the fringe pattern shifts by one fringe width. The value of t is (λ is the wavelength of the light used):

(A) $\frac{\lambda}{2(\mu-1)}$
(B) $\frac{\lambda}{(2\mu-1)}$
(C) $\frac{2\lambda}{(\mu-1)}$
(D) $\frac{\lambda}{(\mu-1)}$

Answer: (D) $\frac{\lambda}{(\mu-1)}$ · Key from source paper

Q129 JEE Main 2019 · 12 Apr · Shift 2 MCQ

A system of three polarizers $\mathrm{P}_1, \mathrm{P}_2, \mathrm{P}_3$ is set up such that the pass axis of P_3 is crossed with respect to that of P_1. The pass axis of P_2 is inclined at 60° to the pass axis of P_3. When a beam of unpolarized light of intensity I_o is incident on P_1, the intensity of light transmitted by the three polarizers is I . The ratio $(\mathrm{I}_\mathrm{o}/\mathrm{I})$ equals (nearly):

(A) 5.33
(B) 16.00
(C) 1.80
(D) 10.67

Answer: (D) 10.67 · Key from source paper

Q130 JEE Main 2019 · 10 Apr · Shift 2 MCQ

In a Young's double-slit experiment, the ratio of the slit's width is $4:1$. The ratio of the intensity of maxima to minima, close to the central fringe on the screen, will be

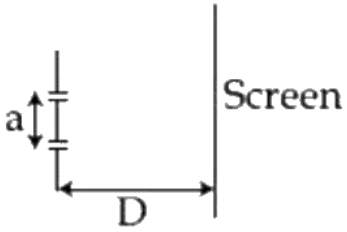
(A) $25:9$
(B) $9:1$
(C) $\sqrt{3}+1^4:16$
(D) $4:1$

Answer: (B) $9:1$ · Key from source paper

Q131 JEE Main 2019 · 9 Apr · Shift 1 MCQ

The figure shows a Young's double slit experimental setup. It is observed that when a thin transparent sheet of thickness t and refractive index μ is put in front of one of the slits, the central maximum gets shifted by a distance equal to n fringe width. If the wavelength of light used is λ then t will be:
(see the figure above)

Q26. The figure shows a Young's double slit experimental setup. It is observed that when a thin transparent sheet of thickness t and refractive index μ is put in front of one of the slits, the central maximum gets shifted by a distance equal to n fringe width. If the wavelength of light used is λ then t will be:



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

(A) $\frac{D\lambda}{a(\mu-1)}$
(B) $\frac{n\lambda}{(\mu-1)}$
(C) $\frac{2n\lambda}{(\mu-1)}$
(D) $\frac{2D\lambda}{a(\mu-1)}$

Answer: (B) $\frac{n\lambda}{(\mu-1)}$ · Key from source paper

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Q132 JEE Main 2019 · 8 Apr · Shift 1 MCQ

In an interference experiment the ratio of amplitudes of coherent waves is $\frac{a_1}{a_2} = \frac{1}{3}$. The ratio of maximum and minimum intensities of fringes will be:

(A) 4
(B) 9
(C) 2
(D) 18

Answer: (A) 4 · Key from source paper

Q133 JEE Main 2019 · 8 Apr · Shift 2 MCQ

Calculate the limit of resolution of a telescope objective having a diameter of 200 cm , if it has to detect light of wavelength 500 nm coming from a star.

(A) 305×10^{-9} radian
(B) 610×10^{-9} radian
(C) 152.5×10^{-9} radian
(D) 457.5×10^{-9} radian

Answer: (A) 305×10^{-9} **radian** · Key from source paper

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Q134 JEE Main 2019 · 11 Jan · Shift 1 MCQ

In a Young's double slit experiment, the path difference, at a certain point on the screen, betwen two interfering waves is $\frac{1}{8}$ th of wavelength. The ratio of the intensity at this point to that at the centre of a bright fringe is close to:

(A) 0.74
(B) 0.85
(C) 0.94
(D) 0.8

Answer: (B) 0.85 · Key from source paper

Q135 JEE Main 2019 · 11 Jan · Shift 2 MCQ

In a double-slit experiment, green light (5303 A) falls on a double slit having a separation of 19.44μm and a width of 4.05μm. The number of bright fringes between the first and the second diffraction minima is

(A) 10
(B) 5
(C) 4
(D) 9

Answer: (B) 5 · Key from source paper

Q136 JEE Main 2019 · 10 Jan · Shift 1 MCQ

In Young's double slit experiment slit separation $0.1\ mm$, one observes a bright fringe at angle $\frac{1}{40}\ rad$ by using light of wavelength λ_1. When the light of wavelength λ_2 is used a bright fringe is seen at the same angle in the same set up. Given that λ_1 and λ_2 are in visible range ($380\ nm$ to $740\ nm$), their values are:

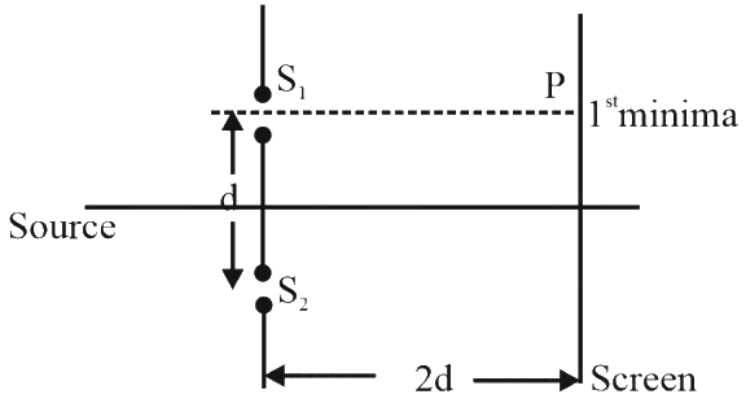
(A) $400\ nm,\ 500\ nm$
(B) $380\ nm,\ 525\ nm$
(C) $625\ nm,\ 500\ nm$
(D) $380\ nm,\ 500\ nm$

Answer: (C) $625\ nm,\ 500\ nm$ · Key from source paper

Q137 JEE Main 2019 · 10 Jan · Shift 2 MCQ

Consider a Young's double slit experiment as shown in figure. What should be the slit separation d in terms of wavelength λ such that the first minima occurs directly in front of the slit (S_1) ?
(see the figure above)

Q26. Consider a Young's double slit experiment as shown in figure. What should be the slit separation d in terms of wavelength λ such that the first minima occurs directly in front of the slit (S_1) ?



(1) $\frac{\lambda}{\left(5-\sqrt{2}\right)}$
(2) $\frac{\lambda}{2\left(\sqrt{5}-2\right)}$
(3) $\frac{\lambda}{2\left(5-\sqrt{2}\right)}$
(4) $\frac{\lambda}{\sqrt{5}-2}$

(A) $\frac{\lambda}{\left(5-\sqrt{2}\right)}$
(B) $\frac{\lambda}{2\left(\sqrt{5}-2\right)}$
(C) $\frac{\lambda}{2\left(5-\sqrt{2}\right)}$
(D) $\frac{\lambda}{\sqrt{5}-2}$

Answer: (B) $\frac{\lambda}{2\left(\sqrt{5}-2\right)}$ · Checked by our team

Q138 JEE Main 2019 · 9 Jan · Shift 1 MCQ

Two coherent sources produce waves of different intensities which interfere. After interference, the ratio of the maximum intensity to the minimum intensity is 16 . The intensity of the waves are in the ratio:

(A) $25:9$
(B) $16:9$
(C) $5:3$
(D) $4:1$

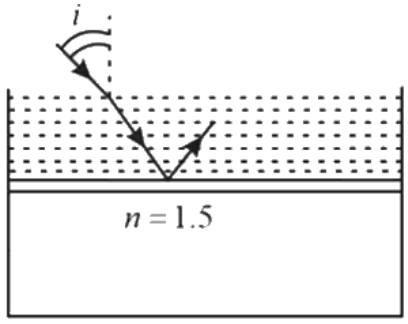
Answer: (A) $25:9$ · Key from source paper

Q139 JEE Main 2019 · 9 Jan · Shift 1 MCQ

Consider a tank made of glass (refractive index 1.5) with a thick bottom. It is filled with a liquid of refractive index μ. A student finds that, irrespective of what the incident angle i (see figure) is for a beam of light entering the liquid, the light reflected from the liquid glass interface is never completely

polarized. For this to happen, the minimum value of μ is:
(see the figure above)

Q28. Consider a tank made of glass (refractive index 1.5) with a thick bottom. It is filled with a liquid of refractive index μ. A student finds that, irrespective of what the incident angle i (see figure) is for a beam of light entering the liquid, the light reflected from the liquid glass interface is never completely polarized. For this to happen, the minimum value of μ is:



(1) $\frac{3}{\sqrt{5}}$
(2) $\frac{4}{3}$
(3) $\frac{5}{\sqrt{3}}$
(4) $\sqrt{\frac{5}{3}}$

(A) $\frac{3}{\sqrt{5}}$
(B) $\frac{4}{3}$
(C) $\frac{5}{\sqrt{3}}$
(D) $\sqrt{\frac{5}{3}}$

Answer: (A) $\frac{3}{\sqrt{5}}$ · Key from source paper

Q140 JEE Main 2019 · 9 Jan · Shift 2 MCQ

In a young's double slit experiment, the slits are placed $0.320\ mm$ apart. Light of wavelength $\lambda = 500\ nm$ is incident on the slits. The total number of bright fringes that are observed in the angular range $-30^o \leq \theta \leq 30^o$ is:

(A) 321
(B) 641
(C) 320
(D) 640

Answer: (B) 641 · Key from source paper

Q141 JEE Main 2018 · 16 Apr · Online MCQ

Unpolarized light of intensity I is incident on a system of two polarizers, A followed by B. The intensity of emergent light is $\frac{I}{2}$. If a third polarizer C is placed between A and B the intensity of emergent light is reduced to $\frac{I}{3}$. The angle between the polarizers A and C is θ, then

(A) $\cos\theta = \left(\frac{2}{3}\right)^{\frac{1}{4}}$
(B) $\cos\theta = \left(\frac{1}{3}\right)^{\frac{1}{4}}$
(C) $\cos\theta = \left(\frac{1}{3}\right)^{\frac{1}{2}}$
(D) $\cos\theta = \left(\frac{2}{3}\right)^{\frac{1}{2}}$

Answer: (A) $\cos\theta = \left(\frac{2}{3}\right)^{\frac{1}{4}}$ · Key from source paper

Q142 JEE Main 2018 · 15 Apr · Shift 1 MCQ

Light of wavelength $550\ \text{nm}$ falls normally on a slit of width $22.0 \times 10^{-5}\ \text{cm}$. The angular position of the second minima from the central maximum will be (in radians)

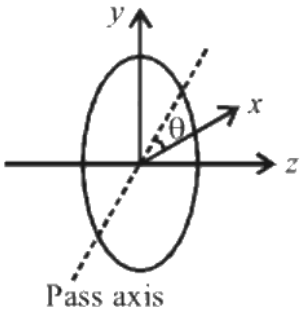
(A) $\frac{\pi}{8}$
(B) $\frac{\pi}{12}$
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{6}$

Answer: (D) $\frac{\pi}{6}$ · Checked by our team

Q143 JEE Main 2018 · 15 Apr · Shift 2 MCQ

A plane polarized light is incident on a polariser with its pass axis making angle θ with x-axis, as shown in the figure. At four different values of θ, $\theta = 8^\circ, 38^\circ, 188^\circ$ and 218°, the observed intensities are same. What is the angle between the direction of polarization and x-axis
(see the figure above)

Q25. A plane polarized light is incident on a polariser with its pass axis making angle θ with x-axis, as shown in the figure. At four different values of $\theta, \theta = 8^\circ, 38^\circ, 188^\circ$ and 218°, the observed intensities are same. What is the



angle between the direction of polarization and x-axis
(1) 203° (2) 45°
(3) 98° (4) 128°

(A) 203°
(B) 45°
(C) 98°
(D) 128°

Answer: (A) 203° · Key from source paper

Q144 JEE Main 2018 · 8 Apr · Offline MCQ

Unpolarized light of intensity I passes through an ideal polariser A. Another identical polariser B is placed behind A. The intensity of light beyond B is found to be $\frac{I}{2}$. Now another identical polariser C is placed between A and B. The intensity beyond B is now found to be $\frac{I}{8}$. The angle between polariser A and C is

(A) 60°
(B) 0°
(C) 30°
(D) 45°

Answer: (D) 45° · Key from source paper

Q145 JEE Main 2018 · 8 Apr · Offline MCQ

The angular width of the central maximum in a single slit diffraction pattern is 60° . The width of the slit is $1\ \mu\text{m}$. The slit is illuminated by monochromatic plane waves. If another slit of the same width is made near it, Young's fringes can be observed on a screen placed at a distance $50\ \text{cm}$ from the slits. If the observed fringe width is $1\ \text{cm}$, what is slit separation distance? (i.e., the distance between the centres of each slit.)

(A) $100\ \mu\text{m}$
(B) $25\ \mu\text{m}$
(C) $50\ \mu\text{m}$
(D) $75\ \mu\text{m}$

Answer: (B) $25\ \mu\text{m}$ · Key from source paper

Q146 JEE Main 2017 · 9 Apr · Online MCQ

A single slit of width 0.1 mm is illuminated by a parallel beam of light of wavelength 6000 Å and diffraction bands are observed on a screen 0.5 m from the slit. The distance of the third dark band from the central bright band is:

(A) 9 mm
(B) 3 mm
(C) 4.5 mm
(D) 1.5 mm

Answer: (A) 9 mm · Key from source paper

Q147 JEE Main 2017 · 8 Apr · Online MCQ

A single slit of width b is illuminated by a coherent monochromatic light of wavelength λ. If the second and fourth minima in the diffraction pattern at a distance 1 cm from the slit are at 3 cm and 6

cm respectively from the central maximum, what is the width of the central maximum? (i.e. distance between first minimum on either side of the central maximum)

(A) 4.5 cm
(B) 1.5 cm
(C) 6.0 cm
(D) 3.0 cm

Answer: (D) 3.0 cm · Key from source paper

Q148 JEE Main 2017 · 2 Apr · Offline MCQ

In Young's double slit experiment, slits are separated by $0.5\ \text{mm}$, and the screen is placed $150\ \text{cm}$ away. A beam of light consisting of two wavelengths, $650\ \text{nm}$ and $520\ \text{nm}$, is used to obtain interference fringes on the screen. The least distance from the common central maximum to the point where the bright fringes due to both the wavelengths coincide is:

(A) $15.6\ \text{mm}$
(B) $1.56\ \text{mm}$
(C) $7.8\ \text{mm}$
(D) $9.75\ \text{mm}$

Answer: (C) $7.8\ \text{mm}$ · Key from source paper

Q149 JEE Main 2016 · 10 Apr · Online MCQ

Two stars are 10 light years away from the earth. They are seen through a telescope of objective diameter 30 cm. The wavelength of light is 600nm. To see the stars just resolved by the telescope, the minimum distance between them should be $(1\ light\ year = 9.46 \times 10^{15} m)$ of the order of :

(A) $10^8 km$
(B) $10^{10} km$
(C) $10^{11} km$
(D) $10^6 km$

Answer: (A) $10^8 km$ · Key from source paper

Q150 JEE Main 2016 · 9 Apr · Online MCQ

In Young's double-slit experiment, the distance between slits and the screen is 1 m and monochromatic light of wavelength 600 nm is being used. A person standing near the slits is looking at the fringe pattern. When the separation between the slits is varied, the interference pattern disappears for a particular distance d_0 between the slits. If the angular resolution of the eye is $\frac{1}{60}^\circ$, then the value of d_0 is close to

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

Answer: (C) 2 mm · Key from source paper

Q151 JEE Main 2016 · 3 Apr · Offline MCQ

The box of a pin hole camera, of length L, has a hole of radius a. It is assumed that when the hole is illuminated by a parallel beam of light of wavelength λ the spread of the spot (obtained on the opposite wall of the camera) is the sum of its geometrical spread and the spread due to diffraction. The spot would then have its minimum size (say b_{min}) when:

(A) $a = \sqrt{\lambda L}$ and $b_{min} = \sqrt{4\lambda L}$
(B) $a = \frac{\lambda^2}{L}$ and $b_{min} = \sqrt{4\lambda L}$
(C) $a = \frac{\lambda^2}{L}$ and $b_{min} = \left(\frac{2\lambda^2}{L}\right)$
(D) $a = \sqrt{\lambda L}$ and $b_{min} = \left(\frac{2\lambda^2}{L}\right)$

Answer: (A) $a = \sqrt{\lambda L}$ **and** $b_{min} = \sqrt{4\lambda L}$ · Key from source paper

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Q152 JEE Main 2015 · 11 Apr · Online MCQ

In a Young's double slit experiment with light of wavelength λ, the separation of slits is d and distance of screen is D such that $D \gg d \gg \lambda$. If the Fringe width is β, the distance from point of maximum intensity to the point where intensity falls to half of the maximum intensity on either side is:

(A) $\frac{\beta}{4}$
(B) $\frac{\beta}{3}$
(C) $\frac{\beta}{6}$
(D) $\frac{\beta}{2}$

Answer: (A) $\frac{\beta}{4}$ · Key from source paper

Q153 JEE Main 2015 · 11 Apr · Online MCQ

Unpolarized light of intensity I_0 is incident on surface of a block of glass at Brewster's angle. In that case, which one of the following statements is true?

(A) transmitted light is partially polarized with intensity $\frac{I_0}{2}$
(B) transmitted light is completely polarized with intensity less than $\frac{I_0}{2}$
(C) reflected light is partially polarized with intensity $\frac{I_0}{2}$
(D) reflected light is completely polarized with intensity less than $\frac{I_0}{2}$

Answer: (D) reflected light is completely polarized with intensity less than $\frac{I_0}{2}$ · Key from source paper

Q154 JEE Main 2015 · 4 Apr · Offline MCQ

On a hot summer night, the refractive index of air is the smallest near the ground and increases with a height from the ground. When a light beam is directed horizontally, the Huygens' principle leads us to conclude that as it travels, the light beam,

(A) bends upward.
(B) becomes narrower.
(C) goes horizontally without any deflection.
(D) bends downward.

Answer: (A) bends upward. · Key from source paper

Q155 JEE Main 2015 · 4 Apr · Offline MCQ

Assuming that the human pupil has a radius of $0.25\ \mathrm{cm}$ and a comfortable viewing distance of $25\ \mathrm{cm}$. The minimum separation between two point objects that the human eye can resolve for the light of wavelength $500\ \mathrm{nm}$ is

(A) $300\ \mu\mathrm{m}$
(B) $1\ \mu\mathrm{m}$
(C) $30\ \mu\mathrm{m}$
(D) $100\ \mu\mathrm{m}$

Answer: (C) $30\ \mu\mathrm{m}$ · Key from source paper

Q156 JEE Main 2014 · 19 Apr · Online MCQ

A ray of light is incident from a denser to a rarer medium. The critical angle for total internal reflection is θ_{iC} and Brewster's angle of incidence is θ_{iB}, such that $\frac{\sin\theta_{\mathrm{iC}}}{\sin\theta_{\mathrm{iB}}} = \eta = 1.28$. The relative refractive index of the two media is

(A) 0.4
(B) 0.2
(C) 0.9
(D) 0.8

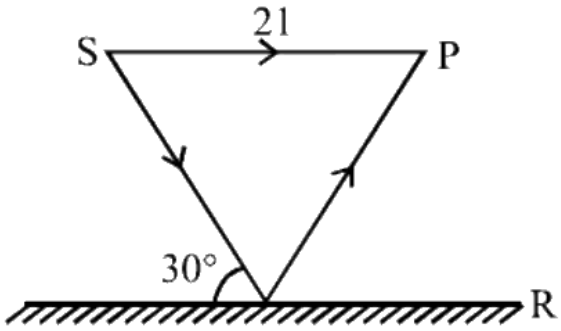
Answer: (D) 0.8 · Key from source paper

Q157 JEE Main 2014 · 12 Apr · Online MCQ

Interference pattern is observed at ' P ' due to superimposition of two rays coming out from a source ' S ' as shown in the figure. The value of ' l ' for which maxima is obtained at ' P ' is: (R is perfect reflecting surface)

(see the figure above)

Q25. Interference pattern is observed at ' P ' due to superimposition of two rays coming out from a source ' S ' as shown in the figure. The value of ' l ' for which maxima is obtained at ' P ' is: (R is perfect reflecting surface)



(1) $1=\frac{2n\lambda}{\sqrt{3}-1}$
(2) $1=\frac{(2n-1)\lambda}{2(\sqrt{3}-1}$)
(3) $1=\frac{(2n-1\lambda)\sqrt{3}}{4(2-\sqrt{3}}$)
(4) $1=\frac{(2n-1)\lambda}{\sqrt{3}-1}$

(A) $l=\frac{2n\lambda}{\sqrt{3}-1}$
(B) $l=\frac{(2n-1)\lambda}{2(\sqrt{3}-1}$)
(C) $l=\frac{(2n-1\lambda)\sqrt{3}}{4(2-\sqrt{3}}$)
(D) $l=\frac{(2n-1)\lambda}{\sqrt{3}-1}$

Answer: (C) $l=\frac{(2n-1\lambda)\sqrt{3}}{4(2-\sqrt{3}}$) · Key from source paper

Q158 JEE Main 2014 · 12 Apr · Online MCQ

In an experiment of single slit diffraction pattern, first minimum for red light coincides with first maximum of some other wavelength. If wavelength of red light is $6600\mathring{A}$, then wavelength of first maximum will be:

(A) $3300\mathring{A}$
(B) $4400\mathring{A}$
(C) $5500\mathring{A}$
(D) $6600\mathring{A}$

Answer: (B) $4400\mathring{A}$ · Key from source paper

Q159 JEE Main 2014 · 11 Apr · Online MCQ

Two monochromatic light beams of intensity 16 and 9 units are interfering. The ratio of intensities of bright and dark parts of the resultant pattern is:

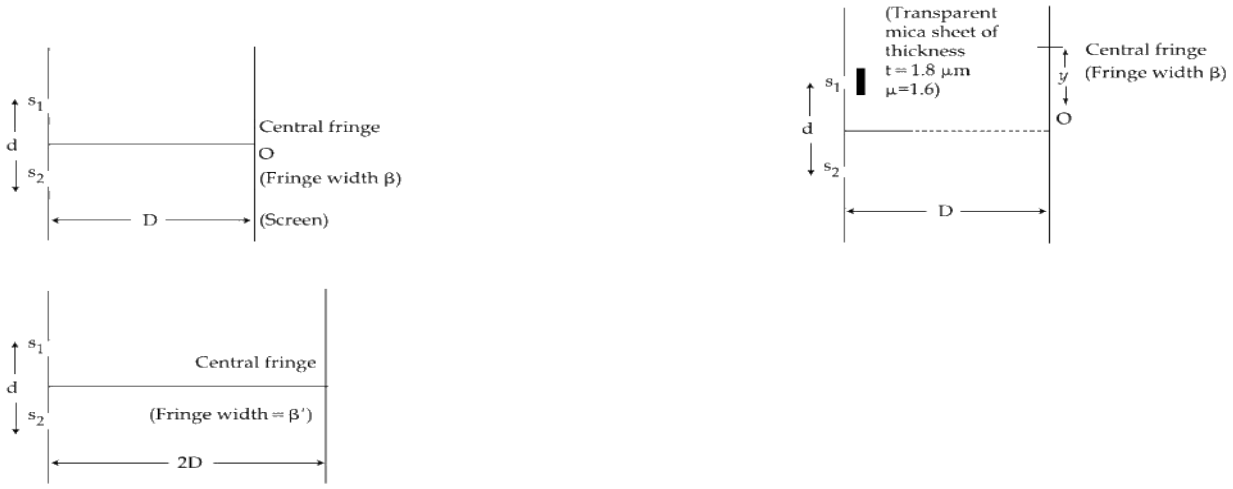
(A) $\frac{16}{9}$
(B) $\frac{4}{3}$
(C) $\frac{7}{1}$
(D) $\frac{49}{1}$

Answer: (D) $\frac{49}{1}$ · Key from source paper

Q160 JEE Main 2014 · 9 Apr · Online MCQ

Using monochromatic light of wavelength λ, an experimentalist sets up the Young's double slit experiment in three ways as shown.
If she observes that $y = \beta'$, the wavelength of light used is :
(see the figure above)

Q25. Using monochromatic light of wavelength λ, an experimentalist sets up the Young's double slit experiment in three ways as shown.
If she observes that $y = \beta'$, the wavelength of light used is :



(1) 520 nm
(2) 580 nm
(3) 540 nm
(4) 560 nm

(A) 520 nm
(B) 580 nm
(C) 540 nm
(D) 560 nm

Answer: (C) 540 nm · Key from source paper

Q161 JEE Main 2014 · 6 Apr · Offline MCQ

Two beams, A and B of plane polarized light with mutually perpendicular planes of polarization are seen through a polaroid. From the position when the beam A has maximum intensity (and beam B has zero intensity), a rotation of polaroid through 30° makes the two beams appear equally bright. If the initial intensities of the two beams are I_A and I_B respectively, then $\frac{I_A}{I_B}$ equals :

(A) 3
(B) $\frac{3}{2}$
(C) 1
(D) $\frac{1}{3}$

Answer: (D) $\frac{1}{3}$ · Key from source paper

Q162 JEE Main 2013 · 25 Apr · Online MCQ

A thin glass plate of thickness is $\frac{2500}{3}\lambda$ (λ is wavelength of light used) and refractive index $\mu = 1.5$ is inserted between one of the slits and the screen in Young's double slit experiment. At a point on the screen equidistant from the slits, the ratio of the intensities before and after the introduction of the glass plate is :

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

Answer: (C) 4 : 1 · Key from source paper

Q163 JEE Main 2013 · 25 Apr · Online MCQ

The source that illuminates the double − slit in 'double - slit interference experiment' emits two distinct monochromatic waves of wavelength 500 nm and 600 nm, each of them producing its own pattern on the screen. At the central point of the pattern when path difference is zero, maxima of both the patterns coincide and the resulting interference pattern is most distinct at the region of zero path difference. But as one moves out of this central region, the two fringe systems are gradually out of step such that maximum due to on wavelength coincides with the minimum due to the other and the combined fringe system becomes completely indistinct. This may happen when path difference in nm is:

(A) 2000
(B) 3000
(C) 1000
(D) 1500

Answer: (D) 1500 · Key from source paper

Q164 JEE Main 2013 · 23 Apr · Online MCQ

n identical waves each of intensity I_0 interfere with each other. The ratio of maximum intensities if the interference is (i) coherent and (ii) incoherent is :

(A) n^2
(B) $\frac{1}{n}$
(C) $\frac{1}{n^2}$
(D) n

Answer: (D) n · Key from source paper

Q165 JEE Main 2013 · 22 Apr · Online MCQ

This question has Statement-1 and Statement-2. Of the four choices given after the Statements, choose the one that best describes the two Statements. Statement-1: In Young's double slit experiment, the number of fringes observed in the field of view is small with longer wavelength of light and is large with shorter wavelength of light. Statement-2: In the double slit experiment the fringe width depends directly on the wavelength of light.

(A) Statement-1 is true, Statement-2 is true and the Statement-2 is correct explanation of the Statement-1.
(B) Statement-1 is false and the Statement-2 is true.
(C) Statement-1 is true Statement-2 is true and the Statement-2 is not correct explanation of the Statement-1.
(D) Statement-1 is true and the Statement-2 is false.

Answer: (A) Statement-1 is true, Statement-2 is true and the Statement-2 is correct explanation of the Statement-1. · Checked by our team

Q166 JEE Main 2013 · 9 Apr · Online MCQ

A ray of light of intensity I is incident on a parallel glass slab at point A as shown in diagram. It undergoes partial reflection and refraction. At each reflection, 25% of incident energy is reflected. The rays AB and A'B' undergo interference. The ratio of $\mathrm{I_{max}}$ and $\mathrm{I_{min}}$ is :

(A) 49 : 1
(B) 7 : 1
(C) 4 : 1
(D) 8 : 1

Answer: (A) 49 : 1 · Key from source paper

Q167 JEE Main 2013 · 9 Apr · Online MCQ

A person lives in a high-rise building on the bank of a river 50 m wide. Across the river is a well lit tower of height 40 m. When the person, who is at a height of 10 m, looks through a polarizer at an appropriate angle at light of the tower reflecting from the river surface, he notes that intensity of light coming from distance X from his building is the least and this corresponds to the light coming from light bulbs at height ' Y ' on the tower. The values of X and Y are respectively close to (refractive index of water $\simeq \frac{4}{3}$)

(A) 25 m, 10 m
(B) 13 m, 27 m
(C) 22 m, 13 m
(D) 17 m, 20 m

Answer: (B) 13 m, 27 m · Key from source paper

Q168 JEE Main 2013 · 7 Apr · Offline MCQ

A beam of unpolarised light of intensity I_0 is passed through a polaroid A and then through another polaroid B which is oriented so that its principle plane makes an angle of 45° relative to that of A. The intensity of the emergent light is:

(A) $\frac{I_0}{4}$
(B) $\frac{I_0}{8}$
(C) I_0
(D) $\frac{I_0}{2}$

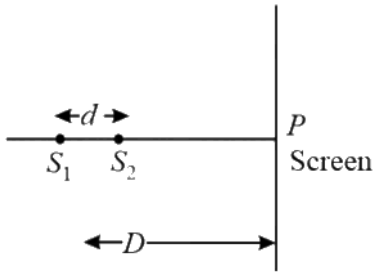
Answer: (A) $\frac{I_0}{4}$ · Key from source paper

Q169 JEE Main 2013 · 7 Apr · Offline MCQ

Two coherent point sources S_1 and S_2 are separated by a small distance d as shown in the figure. The fringes obtained on the screen will be

(see the figure above)

Q26. Two coherent point sources S_1 and S_2 are separated by a small distance d as shown in the figure. The fringes obtained on the screen will be



(1) semi-circles
(2) concentric circles
(3) points
(4) straight lines

(A) semi-circles
(B) concentric circles
(C) points
(D) straight lines

Answer: (B) concentric circles · Key from source paper

Q170 AIEEE 2012 · 26 May · Online MCQ

A telescope of aperture 3×10^{-2} m diameter is focused on a window at 80 m distance fitted with a wire mesh of spacing 2×10^{-3} m. Given: $\lambda = 5.5 \times 10^{-7}$ m, which of the following is true for observing the mesh through the telescope?

(A) Yes, it is possible with the same aperture size.
(B) Possible also with an aperture half the present diameter.
(C) No, it is not possible.
(D) Given data is not sufficient.

Answer: (A) Yes, it is possible with the same aperture size. · Key from source paper

Q171 AIEEE 2012 · 26 May · Online MCQ

In Young's double slit interference experiment, the slit widths are in the ratio $1 : 25$. Then the ratio of intensity at the maxima and minima in the interference pattern is

(A) $3 : 2$
(B) $1 : 25$
(C) $9 : 4$
(D) $1 : 5$

Answer: (C) $9 : 4$ · Key from source paper

Q172 AIEEE 2012 · 19 May · Online MCQ

Two coherent plane light waves of equal amplitude makes a small angle $\alpha(<< 1)$ with each other. They fall almost normally on a screen. If λ is the wavelength of light waves, the fringe width Δx of interference patterns of the two sets of waves on the screen is

(A) $\frac{2\lambda}{\alpha}$
(B) $\frac{\lambda}{\alpha}$
(C) $\frac{\lambda}{(2\alpha)}$
(D) $\frac{\lambda}{\sqrt{\alpha}}$

Answer: (B) $\frac{\lambda}{\alpha}$ · Checked by our team

Q173 AIEEE 2012 · 12 May · Online MCQ

The first diffraction minimum due to the single slit diffraction is seen at $\theta = 30^\circ$ for a light of wavelength $5000\ \text{Å}$ falling perpendicularly on the slit. The width of the slit is

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(A) 2.5×10^{-5} cm
(B) 1.25×10^{-5} cm
(C) 10×10^{-5} cm
(D) 5×10^{-5} cm

Answer: (C) 10×10^{-5} cm · Key from source paper

Q174 AIEEE 2012 · 12 May · Online MCQ

The maximum number of possible interference maxima for slit separation equal to 1.8λ, where λ is the wavelength of light used, in a Young's double slit experiment is

(A) zero
(B) 3
(C) infinite
(D) 5

Answer: (B) 3 · Key from source paper

Q175 AIEEE 2012 · 7 May · Online MCQ

In a Young's double slit experiment with light of wavelength λ, fringe pattern on the screen has fringe width β. When two thin transparent glass (refractive index μ) plates of thickness t_1 and t_2 $(t_1 > t_2)$ are placed in the path of the two beams respectively, the fringe pattern will shift by a distance

(A) $\frac{\beta(\mu-1}{\lambda}\left(\frac{t_1}{t_2}\right)$
(B) $\frac{\mu\beta}{\lambda}\frac{t_1}{t_2}$
(C) $\frac{\beta(\mu-1}{\lambda}(t_1 - t_2$
(D) $\left(\mu - 1\frac{\lambda}{\beta}\right)(t_1 + t_2\ )$

Answer: (C) $\frac{\beta(\mu-1}{\lambda}(t_1 - t_2$ · Key from source paper

Q176 AIEEE 2012 · 7 May · Online MCQ

Two polaroids have their polarizing directions parallel so that the intensity of a transmitted light is maximum. The angle through which either polaroid must be turned if the intensity is to drop by one-half is

(A) 135°
(B) 90°
(C) 120°
(D) 180°

Answer: (A) 135° · Key from source paper

Q177 AIEEE 2012 · Offline MCQ

In Young's double slit experiment, one of the slit is wider than other, so that the amplitude of the light from one slit is double of that from other slit. If I_m be the maximum intensity, the resultant intensity I when they interfere at phase difference ϕ is given by

(A) $\frac{I_m}{9}(4+5\cos\phi)$
(B) $\frac{I_m}{3}\left(1+2\cos^2\frac{\phi}{2}\right)$
(C) $\frac{I_m}{5}\left(1+4\cos^2\frac{\phi}{2}\right)$
(D) $\frac{I_m}{9}\left(1+8\cos^2\frac{\phi}{2}\right)$

Answer: (D) $\frac{I_m}{9}\left(1+8\cos^2\frac{\phi}{2}\right)$ · Key from source paper

Q178 AIEEE 2011 MCQ

Direction: The question has a paragraph followed by two statements, Statement -1 and statement -2. Of the given four alternatives after the statements, choose the one that describes the statements. A thin air film is formed by putting the convex surface of a plane - convex lens over a plane glass plate. With monochromatic light, this film gives an interference pattern due to light reflected from the top (convex) surface and the bottom (glass plate) surface of the film. Statement-1 : When light reflects from the air-glass plate interface, the reflected wave suffers a phase change of π. Statement-2 : The centre of the interference pattern is dark.

(A) Statement-1 is true, Statement-2 is true; Statement-2 is the correct explanation of Statement-1.
(B) Statement-1 is true, Statement-2 is true; Statement-2 is not the correct explanation of Statement-1.
(C) Statement- 1 is false. Statement- 2 is true.
(D) Statement-1 is true, Statement- 2 is false.

Answer: (A) Statement-1 is true, Statement-2 is true; Statement-2 is the correct explanation of Statement-1. · Key from source paper

Q179 AIEEE 2010 MCQ

An initially parallel cylindrical beam travels in a medium of refractive index $\mu(I)=\mu_0+\mu_2 I$, where μ_0 and μ_2 are positive constants and I is the intensity of the light beam. The intensity of the beam is decreasing with increasing radius. As the beam enters the medium, it will

(A) diverge
(B) converge
(C) diverge near the axis and converge near the periphery
(D) travel as a cylindrical beam

Answer: (B) converge · Key from source paper

Q180 AIEEE 2010 MCQ

An initially parallel cylindrical beam travels in a medium of refractive index $\mu(I) = \mu_0 + \mu_2 I$, where μ_0 and μ_2 are positive constants and I is the intensity of the light beam. The intensity of the beam is decreasing with increasing radius. The initial shape of the wave front of the beam is

(A) convex
(B) concave
(C) convex near the axis and concave near the periphery
(D) planar

Answer: (D) planar · Key from source paper

Q181 AIEEE 2009 MCQ

A mixture of light, consisting of wavelength 590 nm and an unknown wavelength, illuminates Young's double slit and gives rise to two overlapping interference patterns on the screen. The central maximum of both lights coincide. Further, it is observed that the third bright fringe of known light coincides with the 4th bright fringe of the unknown light. From this data, the wavelength of the unknown light is

(A) 393.4 nm
(B) 885.0 nm
(C) 442.5 nm
(D) 776.8 nm

Answer: (C) 442.5 nm · Key from source paper

Q182 AIEEE 2007 MCQ

In a Young's double slit experiment the intensity at a point where the path difference is $\frac{\lambda}{6}$ (λ being the wavelength of the light used) is I. If I_0 denotes the maximum intensity, $\frac{\mathrm{I}}{\mathrm{I}_0}$ is equal to

(A) $\frac{1}{\sqrt{2}}$
(B) $\frac{\sqrt{3}}{2}$
(C) 1/2
(D) 3/4

Answer: (D) 3/4 · Key from source paper

Q183 AIEEE 2005 MCQ

A Young's double slit experiment uses a monochromatic source. The shape of the interference fringes formed on a screen is

(A) hyperbola
(B) circle
(C) straight line
(D) parabola

Answer: (C) straight line · Key from source paper

Q184 AIEEE 2005 MCQ

Two point white dots are 1 mm apart on a black paper. They are viewed by eye of pupil diameter 3 mm. Approximately, what is the maximum distance at which these dots can be resolved by the eye? [Take wavelength of light $= 500\ \mathrm{nm}$]

(A) 5 m
(B) 1 m
(C) 6 m
(D) 3 m

Answer: (A) 5 m · Key from source paper

Q185 AIEEE 2005 MCQ

When an unpolarized light of intensity I_0 is incident on a polarizing sheet, the intensity of the light which does not get transmitted is

(A) $\frac{1}{2}\mathrm{I}_0$
(B) $\frac{1}{4}\mathrm{I}_0$
(C) zero
(D) I_0

Answer: (A) $\frac{1}{2}\mathrm{I}_0$ · Key from source paper

Q186 AIEEE 2005 MCQ

If I_0 is the intensity of the principal maximum in the single slit diffraction pattern, then what will be its intensity when the slit width is doubled?

(A) $2\mathrm{I}_0$
(B) $4\mathrm{I}_0$
(C) I_0
(D) $\mathrm{I}_0/2$

Answer: (B) $4\mathrm{I}_0$ · Checked by our team

Q187 AIEEE 2004 MCQ

The angle of incidence at which reflected light totally polarized for reflection from air to glass (refractive index n), is

(A) $\sin^{-1}(n)$
(B) $\sin^{-1}(1/n)$
(C) $\tan^{-1}(1/n)$
(D) $\tan^{-1}(n)$

Answer: (D) $\tan^{-1}(n)$ · Key from source paper

Q188 AIEEE 2004 MCQ

The maximum number of possible interference maxima for slit-separation equal to twice the wavelength in Young's double-slit experiment is

(A) infinite
(B) five
(C) three
(D) zero

Answer: (B) five · Key from source paper

Q189 AIEEE 2003 MCQ

To demonstrate the phenomenon of interference, we require two sources which emit radiation

(A) of nearly the same frequency
(B) of the same frequency
(C) of different wavelengths
(D) of the same frequency and having a definite phase relationship

Answer: (D) of the same frequency and having a definite phase relationship · Key from source paper

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