

JEE MAIN RAY OPTICS AND OPTICAL INSTRUMENTS — PYQS
Max. Marks: 244
Questions: 61
Section A (MCQ) — 49 questions

- Q.1** A thin biconvex lens is prepared from the glass ($\mu = 1.5$) both curved surfaces of which have equal radii of 20 cm each. Left side surface of the lens is silvered from outside to make it reflecting. To have the position of image and object at the same place, the object should be placed, from the lens at a distance of _____ cm.

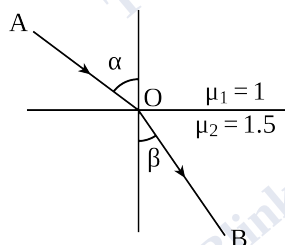
[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) 10 (2) 12.5 (3) 13 (4) 13.5

 Scan or tap for the
full solution


- Q.2** Light ray incident along a vector $\vec{AO}$ ($\vec{AO} = 2\hat{i} - 3\hat{j}$) emerges out along vector $\vec{OB}$ ($\vec{OB} = C\hat{i} - 4\hat{j}$) as shown in the figure below. The value of C is _____.

[JEE Main 2026 (Online) 8th April Evening Shift]

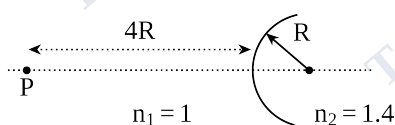


- (1) 1.6 (2) 0.16 (3) 11.6 (4) 16

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full solution


- Q.3** A spherical interface lens of radius R separates two media of refractive indices 1 and 1.4 respectively as shown in the figure below. A point source is placed at a distance of 4R in front of spherical interface. The magnitude of the magnification of point source image is _____.

[JEE Main 2026 (Online) 6th April Morning Shift]



- (1) 1.66 (2) 2.33 (3) 2.66 (4) 1.33

 Scan or tap for the
full solution


- Q.4** Angle of minimum deviation is equal to the half of the angle of prism in an equilateral prism. The refractive index of the prism is _____.

[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) 1.5 (2)
- $\sqrt{3}$
- (3)
- $\sqrt{2}$
- (4) 1.65

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full solution


- Q.5** A ray of light passing through an equilateral prism is having velocity 2.12×10^8 m/s in the prism material, then the minimum angle of deviation is _____ degrees.

[JEE Main 2026 (Online) 5th April Morning Shift]

- (1) 45 (2) 30 (3) 28 (4) 58

 Scan or tap for the
full solution


- Q.6** A compound microscope is designed with two symmetric biconvex lenses. The objective lens is cut vertically, creating two identical plano-convex lenses. One of them is used in place of original objective lens. To retain same magnification keeping the object distance unchanged, the tube length has to be

[JEE Main 2026 (Online) 5th April Morning Shift]

- (1) increased two times (2) increased
- $\frac{3}{2}$
- times
-
- (3) decreased two times (4) decreased
- $\frac{3}{2}$
- times

 Scan or tap for the
full solution


- Q.7** A thin convex lens and a thin concave lens are kept in contact and are co-axial. Which of the following statements is correct for this combination of two lenses ?

[JEE Main 2026 (Online) 5th April Evening Shift]

- (1) behaves as concave lens if
- $|f_{\text{convex}}| > |f_{\text{concave}}|$
-
- (2) behaves as concave lens if
- $|f_{\text{convex}}| < |f_{\text{concave}}|$
-
- (3) behaves as convex lens if
- $|f_{\text{convex}}| > |f_{\text{concave}}|$
-
- (4) Focal length of the lens system will change if the positions of two lenses are interchanged

 Scan or tap for the
full solution


Q.8 An object AB is placed 15 cm on the left of a convex lens P of focal length 10 cm. Another convex lens Q is now placed 15 cm right of lens P. If the focal length of lens Q is 15 cm, the final image is _____.

[JEE Main 2026 (Online) 5th April Evening Shift]

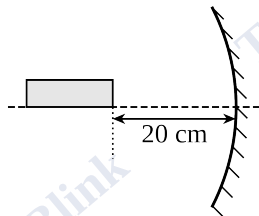
- (1) virtual, formed at 7.5 cm right of lens Q, with a size bigger than that of AB
- (2) real, formed at 7.5 cm right of lens Q, with a size same as that of AB
- (3) formed at infinity.
- (4) real, formed at 7 cm right of lens Q, with a size smaller than that of AB

Scan or tap for the full solution



Q.9 A rod of length 10 cm lies along the principal axis of a concave mirror of focal length 10 cm as shown in figure. The length of the image is _____ cm.

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



- (1) 2.5
- (2) 5
- (3) 7.5
- (4) 7

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Q.10 A convex lens is made from glass material having refractive index of 1.4 with same radius of curvature on both sides. The ratio of its focal length and radius of curvature is _____.

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

- (1) 0.5
- (2) 2.5
- (3) 0.8
- (4) 1.25

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Q.11 For a thin symmetric prism made of glass (refractive index 1.5), the ratio of incident angle and minimum deviation will be _____.

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

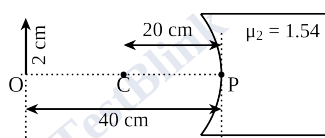
- (1) 3 : 4
- (2) 3 : 2
- (3) 2 : 1
- (4) 1 : 2

Scan or tap for the full solution



Q.12 Refer the figure given below. μ_1 and μ_2 are refractive indices of air and lens material. The height of image will be _____ cm.

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



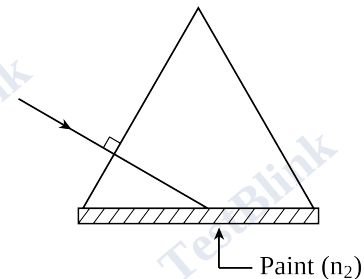
- (1) 1
- (2) 0.5
- (3) 1.2
- (4) 0.25

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Q.13 One side of an equilateral prism is painted by a transparent material of refractive index n_2 . The refractive index of prism is 1.6. The minimum value of n_2 required for total internal reflection from painted face is _____.

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



- (1) $\frac{3\sqrt{3}}{1.6}$
- (2) $\sqrt{3}$
- (3) $\frac{3.2}{\sqrt{3}}$
- (4) $\frac{4\sqrt{3}}{5}$

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Q.14 The magnitudes of power of a biconvex lens (refractive index 1.5) and that of a plano-concave lens (refractive index = 1.7) are same. If the curvature of plano-concave lens exactly matches with the curvature of back surface of the biconvex lens, then ratio of radius of curvature of front and back surface of the biconvex lens is _____

[JEE Main 2026 (Online) 28th January Morning Shift]

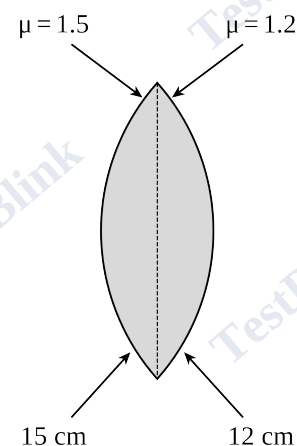
- (1) 2:5
- (2) 5:2
- (3) 12:5
- (4) 5:12

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Q.15 A biconvex lens is formed by using two thin planoconvex lenses, as shown in the figure. The refractive index and radius of curved surfaces are also mentioned in figure. When an object is placed on the left side of lens at a distance of 30 cm from the biconvex lens, the magnification of the image will be :

[JEE Main 2026 (Online) 28th January Evening Shift]



- (1) -2 (2) -2.5 (3) +2.5 (4) +2

Scan or tap for the
full solution



Q.16 For a transparent prism, if the angle of minimum deviation is equal to its refracting angle, the refractive index n of the prism satisfies.

[JEE Main 2026 (Online) 28th January Evening Shift]

- (1) $n \geq 2$ (2) $\sqrt{2} < n < 2$
(3) $1 < n < 2$ (4) $\sqrt{2} < n < 2\sqrt{2}$

Scan or tap for the
full solution



Q.17 The exit surface of a prism with refractive index n is coated with a material having refractive index $\frac{n}{2}$. When this prism is set for minimum angle of deviation, it exactly meets the condition of critical angle. The prism angle is _____.

[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) 60° (2) 30° (3) 15° (4) 45°

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full solution



Q.18 In a microscope of tube length 10 cm two convex lenses are arranged with focal lengths of 2 cm and 5 cm. Total magnification obtained with this system for normal adjustment is $(5)^k$. The value of k is _____.

[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) 4 (2) 5 (3) 2 (4) 3.5

Scan or tap for the
full solution



Q.19 Distance between an object and three times magnified real image is 40 cm. The focal length of the mirror used is _____ cm.

[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) -20 (2) -15/2 (3) -10 (4) -15

Scan or tap for the
full solution



Q.20 Five persons P_1, P_2, P_3, P_4 and P_5 recorded object distance (u) and image distance (v) using same convex lens having power +5 D as (25, 96), (30, 62), (35, 37), (45, 35) and (50, 32) respectively. Identify correct statement

[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) Readings recorded by P_3 and P_2 persons are incorrect
(2) Readings recorded by all persons are correct
(3) Readings recorded by P_3 person are incorrect
(4) Readings recorded by P_4 and P_5 persons are incorrect

Scan or tap for the
full solution



Q.21 A thin prism with angle 5° of refractive index 1.72 is combined with another prism of refractive index 1.9 to produce dispersion without deviation. The angle of second prism is _____.

[JEE Main 2026 (Online) 23rd January Morning Shift]

- (1) 5° (2) 4° (3) 4.5° (4) 6°

Scan or tap for the
full solution



Q.22 Consider light travelling from a medium A to medium B separated by a plane interface. If the light undergoes total internal reflection during its travel from medium A to B and the speed of light in media A and B are 2.4×10^8 m/s and 2.7×10^8 m/s, respectively, then the value of critical angle is :

[JEE Main 2026 (Online) 23rd January Morning Shift]

- (1) $\cos^{-1}\left(\frac{8}{9}\right)$ (2) $\sin^{-1}\left(\frac{9}{8}\right)$
(3) $\cot^{-1}\left(\frac{3}{\sqrt{13}}\right)$ (4) $\tan^{-1}\left(\frac{8}{\sqrt{17}}\right)$

Scan or tap for the
full solution



Q.23 A prism of angle 75° and refractive index $\sqrt{3}$ is coated with thin film of refractive index 1.5 only at the back exit surface. To have total internal reflection at the back exit surface the incident angle must be _____

($\sin 15^\circ = 0.25$ and $\sin 25^\circ = 0.43$)

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) between 15° and 20° (2) 15°
(3) $< 15^\circ$ (4) $> 25^\circ$

Scan or tap for the
full solution



Q.24 A thin convex lens of focal length 5 cm and a thin concave lens of focal length 4 cm are combined together (without any gap) and this combination has magnification m_1 when an object is placed 10 cm before the convex lens. Keeping the positions of convex lens and object undisturbed a gap of 1 cm is introduced between the lenses by moving the concave lens away, which leads to a change in magnification of total lens system to m_2 . The value of $\left|\frac{m_1}{m_2}\right|$ is _____.

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

- (1) $\frac{25}{27}$ (2) $\frac{5}{6}$ (3) $\frac{5}{27}$ (4) $\frac{3}{2}$

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full solution



- Q.25** Consider an equilateral prism (refractive index $\sqrt{2}$). A ray of light is incident on its one surface at a certain angle i . If the emergent ray is found to graze along the other surface then the angle of refraction at the incident surface is close to _____

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

- (1) 30° (2) 20° (3) 40° (4) 15°

Scan or tap for the full solution



- Q.26** The wavelength of light, while it is passing through water is 540 nm. The refractive index of water is $4/3$. The wavelength of the same light when it is passing through a transparent medium having refractive index of $3/2$ is _____ nm.

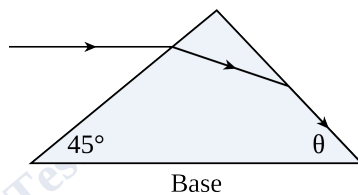
[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 540 (2) 840 (3) 480 (4) 380

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- Q.27** As shown in the diagram, when the incident ray is parallel to base of the prism, the emergent ray grazes along the second surface.



If refractive index of the material of prism is $\sqrt{2}$, the angle θ of prism is.

[JEE Main 2026 (Online) 21st January Evening Shift]

- (1) 75° (2) 90° (3) 60° (4) 45°

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- Q.28** A convex lens of focal length 30 cm is placed in contact with a concave lens of focal length 20 cm. An object is placed at 20 cm to the left of this lens system. The distance of the image from the lens in cm is _____.

[JEE Main 2025 (Online) 8th April Evening Shift]

- (1) $\frac{60}{7}$ (2) 15 (3) 45 (4) 30

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- Q.29** A concave-convex lens of refractive index 1.5 and the radii of curvature of its surfaces are 30 cm and 20 cm, respectively. The concave surface is upwards and is filled with a liquid of refractive index 1.3. The focal length of the liquid-glass combination will be

[JEE Main 2025 (Online) 8th April Evening Shift]

- (1) $\frac{700}{11}$ cm (2) $\frac{600}{11}$ cm (3) $\frac{800}{11}$ cm (4) $\frac{500}{11}$ cm

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- Q.30** Two thin convex lenses of focal lengths 30 cm and 10 cm are placed coaxially, 10 cm apart. The power of this combination is:

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) 5 D (2) 1 D (3) 20 D (4) 10 D

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- Q.31** A lens having refractive index 1.6 has focal length of 12 cm, when it is in air. Find the focal length of the lens when it is placed in water. (Take refractive index of water as 1.28)

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) 355 mm (2) 655 mm (3) 288 mm (4) 555 mm

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- Q.32** Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A): Refractive index of glass is higher than that of air.

Reason (R): Optical density of a medium is directly proportional to its mass density which results in a proportionate refractive index.

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

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) Both (A) and (R) are correct and (R) is the correct explanation of (A)
 (2) (A) is correct but (R) is not correct
 (3) (A) is not correct but (R) is correct
 (4) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

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- Q.33** A mirror is used to produce an image with magnification of $\frac{1}{4}$. If the distance between object and its image is 40 cm, then the focal length of the mirror is _____.

[JEE Main 2025 (Online) 7th April Evening Shift]

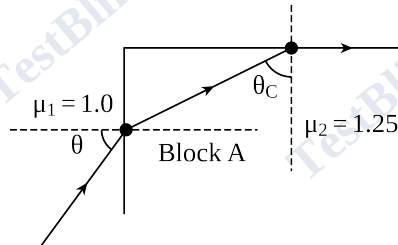
- (1) 10 cm (2) 12.7 cm (3) 10.7 cm (4) 15 cm

Scan or tap for the full solution



- Q.34** A transparent block A having refractive index $\mu = 1.25$ is surrounded by another medium of refractive index $\mu = 1.0$ as shown in the figure. A light ray is incident on the flat face of the block with incident angle θ as shown in the figure. What is the maximum value of θ for which light suffers total internal reflection at the top surface of the block?

[JEE Main 2025 (Online) 7th April Evening Shift]



- (1) $\tan^{-1}(4/3)$ (2) $\sin^{-1}(3/4)$
(3) $\tan^{-1}(3/4)$ (4) $\cos^{-1}(3/4)$

Scan or tap for the full solution



- Q.35** When an object is placed 40 cm away from a spherical mirror an image of magnification $\frac{1}{2}$ is produced. To obtain an image with magnification of $\frac{1}{3}$, the object is to be moved :

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

- (1) 20 cm away from the mirror.
(2) 20 cm towards the mirror.
(3) 80 cm away from the mirror.
(4) 40 cm away from the mirror.

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- Q.36** A finite size object is placed normal to the principal axis at a distance of 30 cm from a convex mirror of focal length 30 cm. A plane mirror is now placed in such a way that the image produced by both the mirrors coincide with each other. The distance between the two mirrors is :

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

- (1) 45 cm (2) 15 cm (3) 22.5 cm (4) 7.5 cm

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- Q.37** Consider following statements for refraction of light through prism, when angle of deviation is minimum.
- The refracted ray inside prism becomes parallel to the base.
 - Larger angle prisms provide smaller angle of minimum deviation.
 - Angle of incidence and angle of emergence become equal.
 - There are always two sets of angle of incidence for which deviation will be same except at minimum deviation setting.

- E. Angle of refraction becomes double of prism angle.

Choose the correct answer from the options given below :

[JEE Main 2025 (Online) 3rd April Morning Shift]

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

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- Q.38** The radii of curvature for a thin convex lens are 10 cm and 15 cm respectively. The focal length of the lens is 12 cm. The refractive index of the lens material is

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) 1.4 (2) 1.8 (3) 1.5 (4) 1.2

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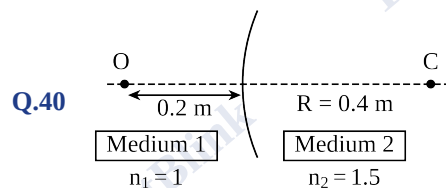


- Q.39** A monochromatic light of frequency 5×10^{14} Hz travelling through air, is incident on a medium of refractive index '2'. Wavelength of the refracted light will be:

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 400 nm (2) 300 nm (3) 600 nm (4) 500 nm

Scan or tap for the full solution



- Q.40**

A spherical surface separates two media of refractive indices 1 and 1.5 as shown in figure. Distance of the image of an object 'O', is : (C is the center of curvature of the spherical surface and R is the radius of curvature)

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

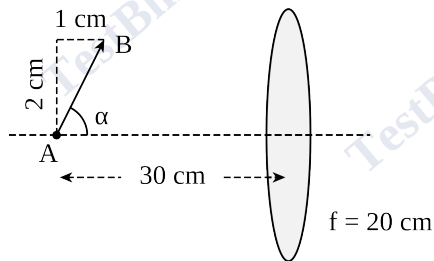
- (1) 0.24 m left to the spherical surface
(2) 0.24 m right to the spherical surface
(3) 0.4 m left to the spherical surface
(4) 0.4 m right to the spherical surface

Scan or tap for the full solution



- Q.41** A slanted object AB is placed on one side of convex lens as shown in the diagram. The image is formed on the opposite side. Angle made by the image with principal axis is :

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



- (1) $-\alpha$ (2) $-\frac{\alpha}{2}$ (3) -45° (4) $+45^\circ$

Scan or tap for the full solution



Q.42 Two identical objects are placed in front of convex mirror and concave mirror having same radii of curvature of 12 cm, at same distance of 18 cm from the respective mirrors. The ratio of sizes of the images formed by convex mirror and by concave mirror is :

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

- (1) 2 (2) $1/2$ (3) $1/3$ (4) 3

Scan or tap for the full solution



Q.43 A bi-convex lens has radius of curvature of both the surfaces same as $1/6$ cm. If this lens is required to be replaced by another convex lens having different radii of curvature on both sides ($R_1 \neq R_2$), without any change in lens power then possible combination of R_1 and R_2 is :

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

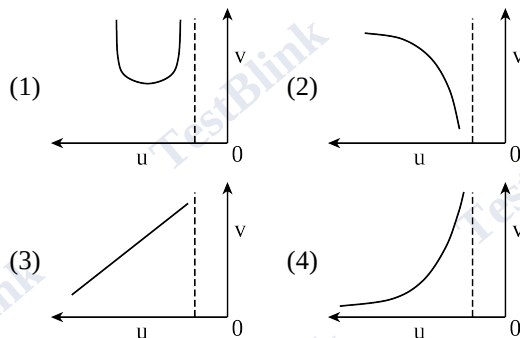
- (1) $\frac{1}{3}$ cm and $\frac{1}{7}$ cm (2) $\frac{1}{5}$ cm and $\frac{1}{7}$ cm
(3) $\frac{1}{3}$ cm and $\frac{1}{3}$ cm (4) $\frac{1}{6}$ cm and $\frac{1}{9}$ cm

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Q.44 Let u and v be the distances of the object and the image from a lens of focal length f . The correct graphical representation of u and v for a convex lens when $|u| > f$, is

[JEE Main 2025 (Online) 29th January Morning Shift]



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Q.45 At the interface between two materials having refractive indices n_1 and n_2 , the critical angle for reflection of an em wave is θ_{1C} . The n_2 material is replaced by another material having refractive index n_3 such that the critical angle at the interface between n_1 and n_3 materials is θ_{2C} . If $n_3 > n_2 > n_1$; $\frac{n_2}{n_3} = \frac{2}{5}$ and $\sin \theta_{2C} - \sin \theta_{1C} = \frac{1}{2}$, then θ_{1C} is :

[JEE Main 2025 (Online) 29th January Morning Shift]

- (1) $\sin^{-1}\left(\frac{1}{6n_1}\right)$ (2) $\sin^{-1}\left(\frac{1}{3n_1}\right)$
(3) $\sin^{-1}\left(\frac{5}{6n_1}\right)$ (4) $\sin^{-1}\left(\frac{2}{3n_1}\right)$

Scan or tap for the full solution



Q.46 A thin prism P_1 with angle 4° made of glass having refractive index 1.54, is combined with another thin prism P_2 made of glass having refractive index 1.72 to get dispersion without deviation. The angle of the prism P_2 in degrees is

[JEE Main 2025 (Online) 28th January Morning Shift]

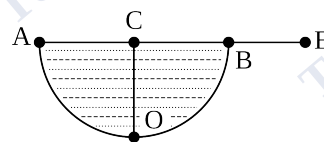
- (1) 1.5 (2) $16/3$ (3) 3 (4) 4

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Q.47 A hemispherical vessel is completely filled with a liquid of refractive index μ . A small coin is kept at the lowest point (O) of the vessel as shown in figure. The minimum value of the refractive index of the liquid so that a person can see the coin from point E (at the level of the vessel) is _____.

[JEE Main 2025 (Online) 28th January Morning Shift]



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

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Q.48 A concave mirror produces an image of an object such that the distance between the object and image is 20 cm. If the magnification of the image is -3 , then the magnitude of the radius of curvature of the mirror is :

[JEE Main 2025 (Online) 28th January Evening Shift]

- (1) 3.75 cm (2) 15 cm (3) 7.5 cm (4) 30 cm

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- Q.49** In a long glass tube, mixture of two liquids A and B with refractive indices 1.3 and 1.4 respectively, forms a convex refractive meniscus towards A. If an object placed at 13 cm from the vertex of the meniscus in A forms an image with a magnification of -2 , then the radius of curvature of meniscus is :

[JEE Main 2025 (Online) 28th January Evening Shift]

- (1) $\frac{2}{3}$ cm (2) $\frac{4}{3}$ cm (3) $\frac{1}{3}$ cm (4) 1 cm

Scan or tap for the full solution



Section B (Numerical) — 12 questions

- Q.50** A concave mirror of focal length 10 cm forms an image which is double the size of object when the object is placed at two different positions. The distance between the two positions of the object is _____ cm.

[JEE Main 2026 (Online) 6th April Evening Shift]

Scan or tap for the full solution



- Q.51** If sunlight is focused on a paper using convex lens, it starts burning the paper in shortest time when the lens is kept at 30 cm above the paper. If the radius of curvature of the lens is 60 cm then the refractive index of the lens material is $\frac{\alpha}{10}$. The value of α is _____. [JEE Main 2026 (Online) 2nd April Evening Shift]

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- Q.52** A convex lens of refractive index 1.5 and focal length $f = 18$ cm is immersed in water. The difference in focal lengths of the given lens when it is in water and in air is $\alpha \times f$. The value of α is _____. (refractive index of water = $\frac{4}{3}$)

[JEE Main 2026 (Online) 28th January Morning Shift]

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- Q.53** The size of the images of an object, formed by a thin lens are equal when the object is placed at two different positions 8 cm and 24 cm from the lens. The focal length of the lens is _____ cm.

[JEE Main 2026 (Online) 23rd January Evening Shift]

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- Q.54** A parallel beam of light travelling in air (refractive index 1.0) is incident on a convex spherical glass surface of radius of curvature 50 cm. Refractive index of glass is 1.5. The rays converge to a point at a distance x cm from the centre of curvature of the spherical surface. The value of x is _____ cm.

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

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- Q.55** In a microscope the objective is having focal length $f_o = 2$ cm and eye-piece is having focal length $f_e = 4$ cm. The tube length is 32 cm. The magnification produced by this microscope for normal adjustment is _____.

[JEE Main 2026 (Online) 21st January Morning Shift]

Scan or tap for the full solution



- Q.56** A collimated beam of light of diameter 2 mm is propagating along x-axis. The beam is required to be expanded in a collimated beam of diameter 14 mm using a system of two convex lenses. If first lens has focal length 40 mm, then the focal length of second lens is _____ mm.

[JEE Main 2026 (Online) 21st January Morning Shift]

Scan or tap for the full solution



- Q.57** A container contains a liquid with refractive index of 1.2 up to a height of 60 cm and another liquid having refractive index 1.6 is added to height H above first liquid. If viewed from above, the apparent shift in the position of bottom of container is 40 cm. The value of H is _____ cm. (Consider liquids are immiscible)

[JEE Main 2025 (Online) 7th April Morning Shift]

Scan or tap for the full solution



- Q.58** Distance between object and its image (magnified by $-\frac{1}{3}$) is 30 cm. The focal length of the mirror used is $\left(\frac{x}{4}\right)$ cm, where magnitude of value of x is _____. [JEE Main 2025 (Online) 4th April Morning Shift]

Scan or tap for the full solution



- Q.59** Light from a point source in air falls on a spherical glass surface (refractive index, $\mu = 1.5$ and radius of curvature = 50 cm). The image is formed at a distance of 200 cm from the glass surface inside the glass. The magnitude of distance of the light source from the glass surface is _____ m.

[JEE Main 2025 (Online) 3rd April Evening Shift]

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- Q.60** A ray of light suffers minimum deviation when incident on a prism having angle of the prism equal to 60° . The refractive index of the prism material is $\sqrt{2}$. The angle of incidence (in degrees) is _____

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

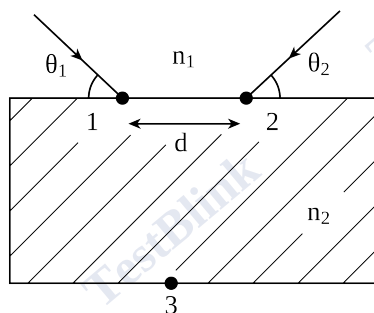
Scan or tap for the full solution



Q.61 Two light beams fall on a transparent material block at point 1 and 2 with angle θ_1 and θ_2 , respectively, as shown in figure. After refraction, the beams intersect at point 3 which is exactly on the interface at other end of the block. Given : the distance between 1 and 2, $d = 4\sqrt{3}$ cm and

$\theta_1 = \theta_2 = \cos^{-1}\left(\frac{n_2}{2n_1}\right)$, where refractive index of the block $n_2 >$ refractive index of the outside medium n_1 , then the thickness of the block is _____ cm.

[JEE Main 2025 (Online) 29th January Morning Shift]



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ANSWER KEY

Section A (MCQ) — 49 questions

Ques.	1	2	3	4	5	6	7
Ans.	1	1	1	3	2	1	1
Ques.	8	9	10	11	12	13	14
Ans.	2	2	4	2	1	4	2
Ques.	15	16	17	18	19	20	21
Ans.	1	2	1	3	4	3	2
Ques.	22	23	24	25	26	27	28
Ans.	4	1, 2, 3	2	4	3	3	2
Ques.	29	30	31	32	33	34	35
Ans.	2	4	3	2	3	2	4
Ques.	36	37	38	39	40	41	42
Ans.	4	4	3	2	3	3	2
Ques.	43	44	45	46	47	48	49
Ans.	2	4	—	3	4	2	1

Section B (Numerical) — 12 questions

Ques.	50	51	52	53	54	55	56
Ans.	10	20	3	16	100	100	280
Ques.	57	58	59	60	61		
Ans.	80	45	4	45	6		