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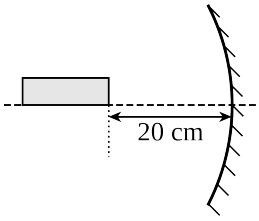
JEE MAIN RAY OPTICS AND OPTICAL INSTRUMENTS — REFLECTION OF LIGHT BY SPHERICAL MIRRORS, MIRROR FORMULA AND MAGNIFICATION — PYQS

Max. Marks: 44 **Questions:** 11

Section A (MCQ) — 8 questions

Q.1 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.2 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

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Q.3 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

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Q.4 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.5 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.6 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

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Q.7 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.8 A concave mirror of focal length f in air is dipped in a liquid of refractive index μ. Its focal length in the liquid will be:

[JEE Main 2025 (Online) 23rd January Evening Shift]

(1) μf (2) f (3) $\frac{f}{\mu}$ (4) $\frac{f}{(\mu - 1)}$

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Section B (Numerical) — 3 questions

Q.9 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]

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Q.10 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]

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Q.11 The driver sitting inside a parked car is watching vehicles approaching from behind with the help of his side view mirror, which is a convex mirror with radius of curvature R = 2 m. Another car approaches him from behind with a uniform speed of 90 km/hr. When the car is at a distance of 24 m from him, the magnitude of the acceleration of the image of the car in the side view mirror is ' a '. The value of 100a is _____ m/s^2.

[JEE Main 2025 (Online) 22nd January Morning Shift]

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ANSWER KEY

Section A (MCQ) — 8 questions

Ques.	1	2	3	4	5	6	7	8			
Ans.	**2**	**4**	**3**	**4**	**4**	**2**	**2**	**2**			

Section B (Numerical) — 3 questions

Ques.	9	10	11								
Ans.	**10**	**45**	**8**								