Prayas JEE (2025)

Physics

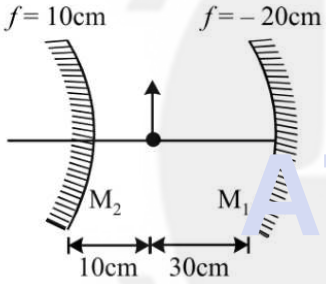
Ray Optics

DPP: 2

Q1 A rod of length $5\ \text{cm}$ lies along the principal axis of a concave mirror of focal length $10\ \text{cm}$ in such a way that the end farther from the pole is $15\ \text{cm}$ away from it. Find the length of the image.

(A) 10 (B) 15
(C) 20 (D) infinite

Q2 In the figure shown find the total magnification after two successive reflections first on M_1 and then on M_2.



(A) + 1 (B) - 2
(C) + 2 (D) - 1

Q3 The image of an illuminated square is obtained on a screen with the help of a converging lens. The distance of the square from the lens is $40\ \text{cm}$. The area of the image is 9 times that of the square. The focal length of the lens is

(A) $36\ \text{cm}$
(B) $27\ \text{cm}$
(C) $60\ \text{cm}$
(D) $30\ \text{cm}$

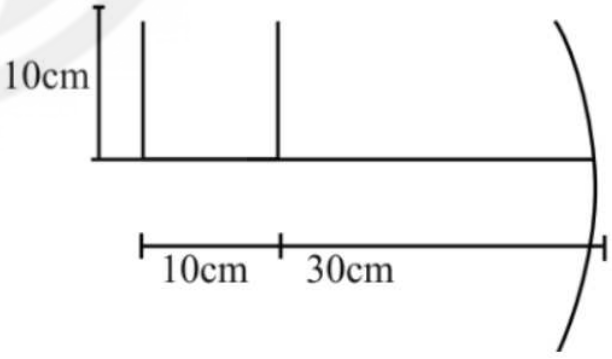
Q4 A concave mirror of focal length $15\ \text{cm}$ forms an image having twice the linear dimensions of the object. The position of the object when the image is virtual will be

(A) $22.5\ \text{cm}$
(B) $7.5\ \text{cm}$
(C) $30\ \text{cm}$
(D) $45\ \text{cm}$

Q5 The relation between the linear magnification m, the object distance u and the focal length f of the spherical mirror is

(A) $m = \frac{f-u}{f}$
(B) $m = \frac{f}{f-u}$
(C) $m = \frac{f+u}{f}$
(D) $m = \frac{f}{f+u}$

Q6 A 'L'-shaped wire is placed before a concave mirror having radius of curvature $20\ \text{cm}$ as shown in figure. Find the total length of the image.



Q7 A convex mirror has a focal length $= 20\ \text{cm}$. A convergent beam tending to converge to a point 20 cm behind convex mirror on principal axis falls on it. The image if formed at

(A) Infinity
(B) $40\ \text{cm}$
(C) $20\ \text{cm}$

(D) $10\ \text{cm}$

Q8 Radius of curvature of concave mirror is $40\ \text{cm}$ and the size of image is twice as that of object, then the object distance is

(A) $60\ \text{cm}$

(B) $20\ \text{cm}$

(C) $40\ \text{cm}$

(D) $30\ \text{cm}$

Q9 If an object is placed $10\ \text{cm}$ in front of a concave mirror of focal length $20\ \text{cm}$, the image will be

(A) Diminished, upright, virtual

(B) Enlarged, upright, virtual

(C) Diminished, inverted, real

(D) Enlarged, upright, real

Q10 An object is placed at $20\ \text{cm}$ from a convex mirror of focal length $10\ \text{cm}$. The image formed by the mirror is

(A) Real and at $20\ \text{cm}$ from the mirror

(B) Virtual and at $20\ \text{cm}$ from the mirror

(C) Virtual and at $20/3\ \text{cm}$ from the mirror

(D) Real and at $20/3\ \text{cm}$ from the mirror

Q11 An object $2.5\ \text{cm}$ high is placed at a distance of $10\ \text{cm}$ from a concave mirror of radius of curvature $30\ \text{cm}$. The size of the image is

(A) $9.2\ \text{cm}$

(B) $10.5\ \text{cm}$

(C) $5.6\ \text{cm}$

(D) $7.5\ \text{cm}$

Answer Key

Q1	D
Q2	C
Q3	D
Q4	B
Q5	B
Q6	10 cm
Q7	A
Q8	D
Q9	B
Q10	C
Q11	D

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