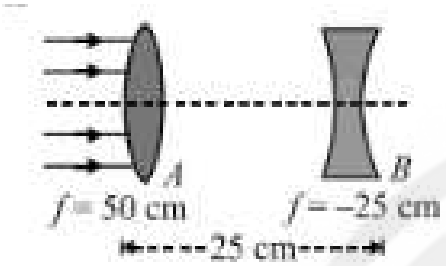
Prayas JEE (2025)

Physics

Ray Optics

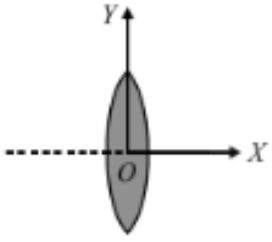
DPP: 5

Q1 The two lenses shown are illuminated by a beam of parallel light from the left. Lens B is then moved slowly towards lens A. The beam emerging from lens B is



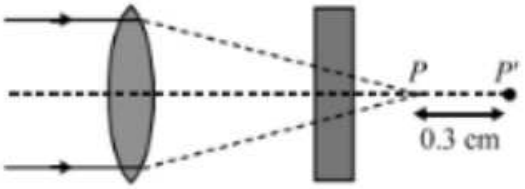
(A) Always diverging
(B) Initially parallel and then diverging
(C) Always parallel
(D) Initially converging and then parallel

Q2 Consider the situation shown in the figure. P is an object whose coordinates are $(-20\ \text{cm}, -2\ \text{cm})$. Determine the coordinates of the image with respect to origin O



(A) $(-20\ \text{cm}, 2\ \text{cm})$
(B) $(20\ \text{cm}, -2\ \text{cm})$
(C) $(20\ \text{cm}, 2\ \text{cm})$
(D) $(-20\ \text{cm}, -2\ \text{cm})$

Q3 Rays from a lens are converging towards a point P, as shown in figure. How much thick glass plate having refractive index 1.6 must be located between the lens and point P, so that image will be formed at P' ?

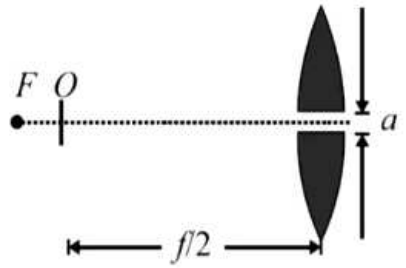


(A) $0.8\ \text{cm}$
(B) $1.6\ \text{cm}$
(C) $5\ \text{cm}$
(D) $2.4\ \text{cm}$

Q4 A lens having focal length f and aperture of diameter d forms an image of intensity I. Aperture of diameter $\frac{d}{2}$ in central region of lens is covered by a black paper. Focal length of lens and intensity of image now will be respectively

(A) f and $\frac{I}{4}$
(B) $\frac{3f}{4}$ and $\frac{I}{2}$
(C) f and $\frac{3I}{4}$
(D) $\frac{f}{2}$ and $\frac{I}{2}$

Q5 A split lens has its two parts separated by a and its focal length is f. An object O is placed at a distance $(f/2)$ on the axis of the undivided lens. The distance between the virtual source is



(A) a (B) 2a
(C) 3f (D) 2f

Q6 A plano-convex lens of refractive index 1.5 and radius of curvature $30\ \mathrm{cm}$ is silvered at the curved surface. Now, this lens has been used to form the image of an object. At what distance from this lens, an object be placed in order to have a real image of the size of the object?
(A) 20 cm (B) 30 cm
(C) 60 cm (D) 80 cm

Q7 The radius of curvature of an equiconvex lens is $40\ \mathrm{cm}$ and its refractive index is 1.5 . It is focal, length is:
(A) 40 cm (B) 20 cm
(C) 80 cm (D) 30 cm

Q8 An equi-convex lens of glass of focal length 0.1 meter is cut along a plane perpendicular to principle axis into two equal parts. The ratio of focal length of new lenses formed is
(A) 1:1 (B) 1:2
(C) 2:1 (D) 2:1/2

Q9 An object of height $1.5\ \mathrm{cm}$ is placed on the axis of a convex lens of focal length $25\ \mathrm{cm}$. A real image is formed at a distance of $75\ \mathrm{cm}$ from the lens. The size of the image will be:
(A) 4.5 cm (B) 3.0 cm
(C) 0.75 cm (D) 0.5 cm

Answer Key

Q1	B
Q2	C
Q3	A
Q4	C
Q5	B
Q6	A
Q7	A
Q8	A
Q9	B

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