



CBSE NCERT Based Chapter wise Questions (2025-2026)

Class-XII

Subject: Physics

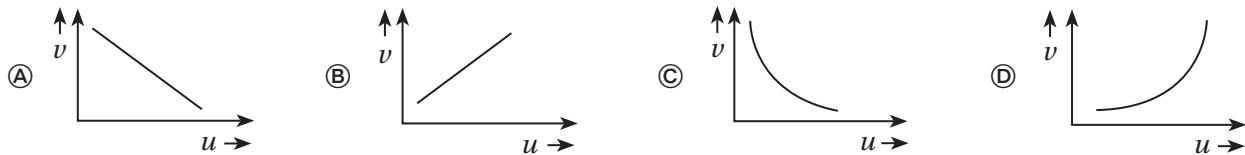
Chapter Name : **Ray Optics (Chap : 6)**

Total : 11 Marks (expected) [MCQ(2)-1 Mark, Assertion-Reason(1)-1 Mark, SA(1)-3 Marks, LA(1)-5 Marks]

Level - 2(Higher order)

MCQ Type :

1. In an experiment to find the focal length of a concave mirror, a graph is drawn between the magnitude of u and v . The graph looks like



[Hints : use the mirror formula]

2. A convex and a concave lens separated by distance d are then put in contact. The focal length of the combination

(A) becomes zero (B) remains the same (C) decreases (D) increases

[Hints : use the formula $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} - \frac{d}{f_1 f_2}$]

3. Two beams of red and violet colours are made to pass separately through a prism (angle of prism is 60°). In the position of minimum deviation, the angle of refraction will be

(A) 30° for both colours (B) greater for violet colour
(C) greater for red colour (D) equal but not 30° for both the colour

[Hints : in minimum deviation equal for all colours $r = r_1 = r_2 = \frac{A}{2}$]

4. A concave mirror of focal length 15 cm forms an image having twice the size of the object and virtual. The object distance will be

(A) 22.5 cm (B) 7.5 cm (C) 30 cm (D) 45 cm

[Hints : use the mirror formula]

5. Convergence of a concave mirror can be decreased by dipping in

(A) water (B) oil (C) both water and oil (D) none of these

[Hints : focal length of mirror only depend on radius of curvature]

6. If focal length of objective lens is increased then magnifying power of

(A) Microscope and Telescope both will decrease
(B) Microscope will decrease but telescope will increase
(C) Microscope will increase but telescope will decrease
(D) Microscope and telescope both will increase

[Hints : use formula for magnifying power of both the instrument]

7. The length of an astronomical telescope for normal vision—

(A) $f_0 \times f_e$ (B) $\frac{f_0}{f_e}$ (C) $f_0 + f_e$ (D) $f_0 - f_e$

[Hints : Refer page no. 245 in NCERT book]

8. The velocity of light in a medium is half its velocity in air. Refractive index of the medium will be

Ⓐ 2

Ⓑ $\frac{1}{2}$

Ⓒ $\frac{1}{\sqrt{2}}$

Ⓓ 2

[Hints : use relation between velocity of light with refractive index]

Assertion-Reason based questions

a) Both Assertion and Reason are correct and Reason is a correct explanation of Assertion

b) Both Assertion and Reason are correct and Reason is not a correct explanation of Assertion

c) Assertion is correct, Reason is incorrect

d) Assertion is incorrect, Reason is correct

9. Assertion : An empty test tube dipped into water in a beaker appears silver, when viewed from a suitable direction.

Reason : Due to refraction of light the substance in water appears silvery.

Ⓐ a

Ⓑ b

Ⓒ c

Ⓓ d

[Hints : Explain by concept of total internal reflection]

10. Assertion : For the sensitivity of a camera, its aperture should be reduced.

Reason : Smaller the aperture, image focusing is also sharp.

Ⓐ a

Ⓑ b

Ⓒ c

Ⓓ d

11. Assertion : The images formed by total internal reflections are brighter than those formed by mirrors or lenses.

Reason : There is no loss of intensity in total internal reflection.

Ⓐ a

Ⓑ b

Ⓒ c

Ⓓ d

12. Assertion : A convex lens is made of two different materials, a point object is placed on the principle axis. The number of images formed by the lens will be two.

Reason : The image formed by convex lens is always virtual.

Ⓐ a

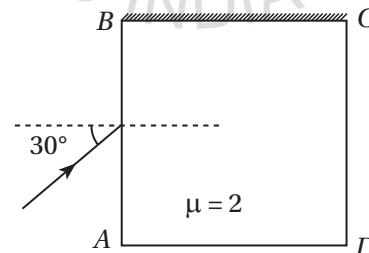
Ⓑ b

Ⓒ c

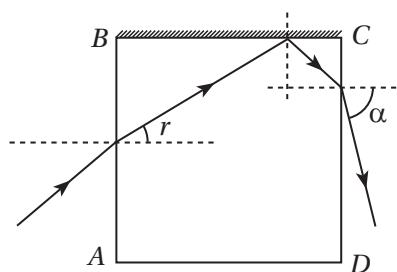
Ⓓ d

Short answer type questions (SA)

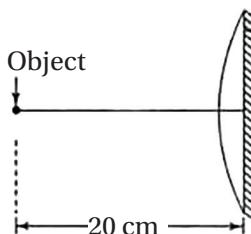
13. In the given figure surface BC of slab is silvered. A ray of light on face AB and emerges out from face CD . Find the angle of emergence?



[Hints : complete the ray diagram and then from Snell's law find α]

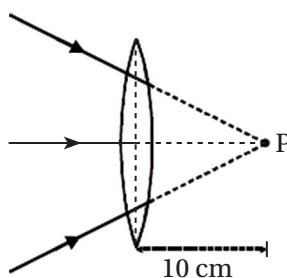


14. A point object is placed at a distance of 20 cm from a thin plano-convex lens of focal length 15 cm. The plane surface of the lens is now silvered. Find the image position.



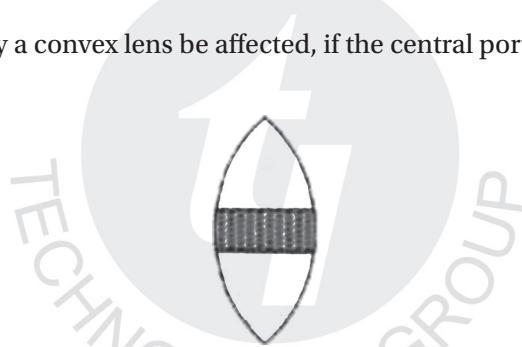
[Hints : first find the focal length of the system and then find the image distance]

15. A converging beam of light converges at point P . A thin convex lens of focal length 20 cm is placed 10 cm before converging point. Find the position of new converging point from the lens.



[Hints : use lens formula and take P is a point object; $u = +10 \text{ cm}$]

16. a) How will the image formed by a convex lens be affected, if the central portion of the lens is wrapped in black paper, as shown in the figure?



b) A convex and a concave lens of same focal length separated by a distance d . What type of lens of this system behaves?

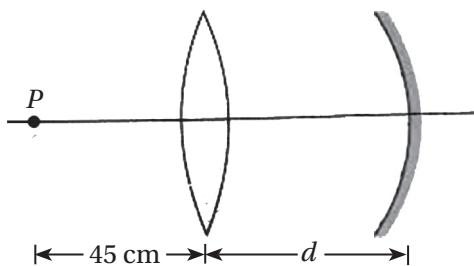
[Hints : use the formula $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} - \frac{d}{f_1 f_2}$]

Long answer type questions (LA)

17. Explain the following observations :

- A red object appears black under sodium lamp light.
- Sun appears red at sunset.
- A rainbow is never formed in the sky of moon.
- A glass prism causes dispersion while a glass plate does not.
- Dispersion is caused by refraction not by reflection.

18. In the following figure find the separation between convex lens (focal length = 30 cm) and concave mirror (focal length = 30 cm) and concave mirror (focal length = 30 cm) if the final image coincide with the object.



[Hints : If an object placed at centre of curvature of the mirror, the image coincide with the object]

19. A square card of side length 1 mm is being seen through a magnifying lens of focal length 10 cm. The card is placed at a distance of 9 cm from the lens. Find the apparent area of the card through the lens.

[Hints : use the formula $dA' = m^2 dA$]

ANSWER

1. C	8. A	14. final image formed at 12 cm to the left
2. D	9. C	15. 6.67 cm right
3. A	10. C	16.
4. B	11. A	17.
5. D	12. D	18. $d = 150$ cm
6. B	13. $\alpha = 30^\circ$	19. 1 cm^2
7. C		