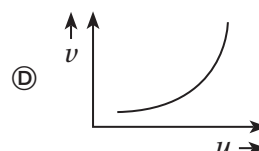
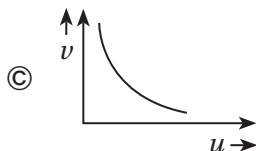
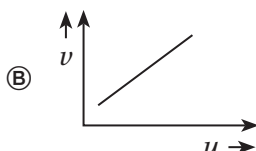
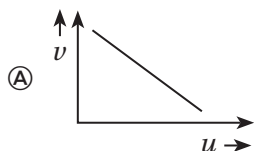


MCQ Type :

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

- (A) 2 (B) $\frac{1}{2}$ (C) $\frac{1}{\sqrt{2}}$ (D) 2

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

Assertion-Reason based questions

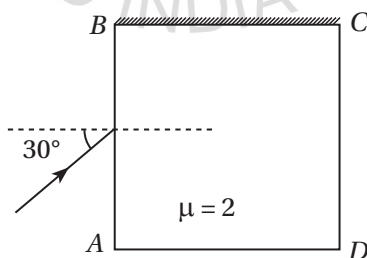
- a) Both Assertion and Reason are correct and Reason is a correct explanation of Assertion
 b) Both Assertion and Reason are correct and Reason is not a correct explanation of Assertion
 c) Assertion is correct, Reason is incorrect
 d) Assertion is incorrect, Reason is correct
9. Assertion : An empty 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) a (B) b (C) c (D) d

[Hints : Explain by concept of total internal reflection]

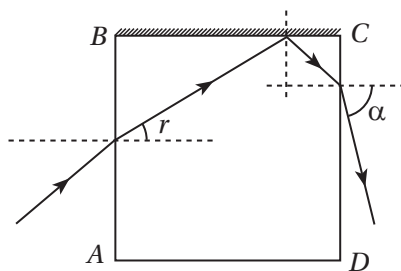
10. Assertion : For the sensitivity of a camera, its aperture should be reduced.
 Reason : Smaller the aperture, image focusing is also sharp.
- (A) a (B) b (C) c (D) d
11. Assertion : The images formed by total internal reflections are brighter than those formed by mirrors or lenses.
 Reason : There is no loss of intensity in total internal reflection.
- (A) a (B) b (C) c (D) 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) a (B) b (C) c (D) d

Short answer type questions (SA)

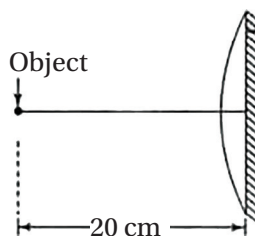
13. In the given figure surface BC of slab is silvered. A ray of light on face AB and emerges out from face CD . Find the angle of emergence?



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

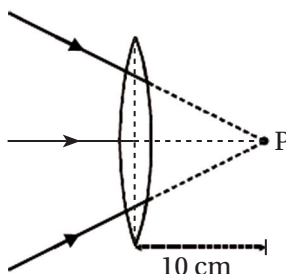


14. A point object is placed at a distance of 20 cm from a thin plano-convex lens of focal length 15 cm. The plane surface of the lens is now silvered. Find the image position.



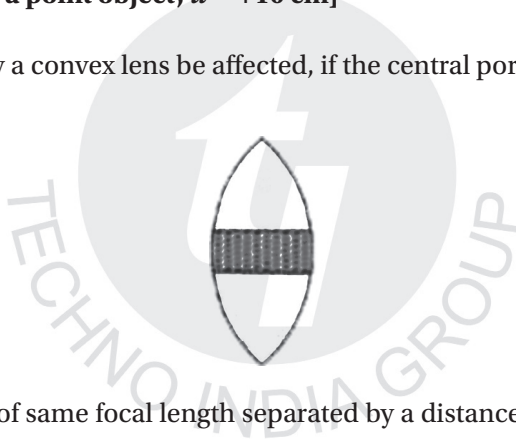
[Hints : first find the focal length of the system and then find the image distance]

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; $u = +10$ 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?

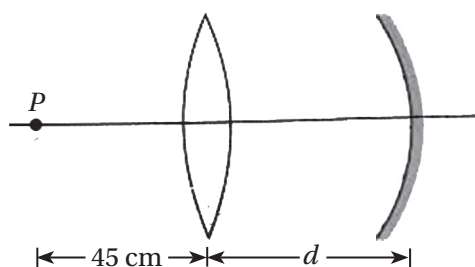
[Hints : use the formula $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} - \frac{d}{f_1 f_2}$]

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) 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 $mA' = m^2 dA$]

ANSWER

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

