



Octahedral classes, kharadi
2nd floor, yashwant plaza, near bank of India,

Class 10 - Science

Light

Maximum Marks: 105

Time Allowed: 2 hours

Section A

1. A concave lens has a focal length of 10 cm. An object 2.5 cm high is placed 30 cm from the lens. Determine the position and size of the image. 3
2. A concave mirror produces three times magnified real image of an object placed at 10 cm in front of it. Where is the image located ? 3
3. A real image, $\frac{4}{5}$ size of the object is formed 18 cm from a lens. Calculate focal length of the lens. 3
4. An object is placed at a distance of 10 cm from a convex mirror of focal length 15 cm. Find the position and nature of image. 3
5. A concave mirror of focal length 10 cm is placed at a distance of 35 cm from a wall. How far from the wall an object be placed so that its image formed by mirror falls on the wall? 3
6. Define 1 dioptre of power of a lens. 3
7. What is the cause of refraction of light? 3
8. Draw ray diagram showing the image formation by a concave lens when an object is placed between focus and twice the focal length of the lens. 3
9. What is the relationship between the refractive index of two media? 3
10. Redraw the given diagram and show the path of the refracted ray. 3
11. Draw ray diagram showing the image formation by a convex lens when an object is placed at infinity. 3
12. Three mirrors, one plane, one concave and one convex are lying on the table. How can a person identify them without touching them or using any other apparatus or device. 3
13. State the types of mirror preferred as (i) rear view mirror in vehicles, (ii) shaving mirror. Justify your answer two reason in each case. 3
14. Velocity of light in diamond is $1.2 \times 10^8 \text{ ms}^{-1}$ and in vacuum, it is $3 \times 10^8 \text{ ms}^{-1}$, what is refractive index of diamond ? 3
15. Draw ray diagram showing the image formation by a concave mirror when an 3

- object placed at infinity.
16. Find the focal length of a convex mirror whose radius of curvature is 32 cm. 3
 17. Draw ray diagram showing the image formation by a convex lens when an object is placed at twice the focal length of the lens. 3
 18. A doctor has prescribed a corrective lens of power + 1.5 D. Find the focal length of lens. Is prescribed lens diverging or converging? 3
 19. Draw ray diagram showing the image formation by a convex lens when an object is placed between optical centre and focus of the lens. 3
 20. A truck uses a convex mirror as view finder whose radius of curvature is 2.0 m. A maruti car is coming behind the truck at a distance of 10 m. What will be the position of the image of the car and size of the image of the car when observed by the driver of the truck through the convex mirror? 3
 21. An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed, so that a sharp focused image can be obtained? Find the size and the nature of the image. 3
 22. How can you show that if a ray enters a rectangular glass slab obliquely and emerges from the opposite face, the emergent ray is parallel to the incident ray. 3
 23. What is mirror formula ? Does this formula hold good for a plane mirror ? 3
 24. We wish to obtain an erect image of an object, using a concave mirror of focal length 15 cm. What should be the range of distance of the object from mirror? What is the nature of image? Is the image larger or smaller than the object? Draw a ray diagram to show the image formation in this case. 3
 25. Name the type of mirror used in the following situations: 3
 - (a) Headlights of a car
 - (b) Side/rear-view mirror of a vehicle.
 - (c) Solar furnace.
 Support your answer with reason.
 26. One half of a convex lens is covered with a black paper. Will this lens produce a complete image of the object? Explain your observation. 3
 27. Draw ray diagram showing the image formation by a convex lens when an object is placed at the focus of the lens. 3
 28. The refractive indices 1.0003, 1.31 1.5 respectively of Air, Ice and Benzine in which of these does the light travels fastest? 3

29. Distinguish between real image and virtual image. **3**
30. Name the type of mirror used in the following situations. Solar furnace. **3**
Suppose your answer with reason.
31. Why does a ray of light bend when it travels from one medium into another? **3**
32. A convex lens of focal length 15 cm forms an image 10 cm from the lens. How far is the object placed from the lens? Draw the ray diagram. **3**
33. Why does a concave mirror has a real principal focus? **3**
34. The refractive index of diamond is 2.42. What is the meaning of this statement? **3**
35. What are the uses of concave mirrors? **3**