ANSWERS

Multiple Choice Questions

|							
1. (a)		**2.** (b)		**3.** (c)		**4.** (a)
5. (b)		**6.** (a)		**7.** (d)		**8.** (a)
9. (a)		**10.** (b)		**11.** (b)		**12.** (b)
13. (d)		**14.** (b)		**15.** (d)		**16.** (d)
17. (a)		**18.** (c)		**19.** (d)		

Short Answer Questions

20. (a) concave mirror

(b) convex lens
(c) concave lens
(d) convex mirror

21. Hint— Draw the diagram and explain using laws of refractions at both the interfaces.

22. Hint— No. Bending will be different in different liquids since velocity of light at the interface separating two media depends on the relative refractive index of the medium.

23. Hint— $n = \dfrac{c}{v}$

$n_{21} = \dfrac{v_1}{v_2}$

24. Hint— $n_{dg} = \dfrac{v_g}{v_d} = 1.6, \quad n_g = \dfrac{c}{v_g}, \text{ and } n_d = \dfrac{c}{v_d}$

Therefore, $\dfrac{v_g}{v_d} \times \dfrac{c}{v_g} = n_d = 1.6 \times 1.5 = 2.40.$

25. Hint— Statement is correct if the object is placed within 20 cm from the lens in the first case and between 20 cm and 40 cm in the second case.

26. **Hint—** Sudha should move the screen towards the lens so as to obtain a clear image of the building. The approximate focal length of this lens will be 15 cm.

27. $P = \dfrac{1}{f}$, $P \propto \dfrac{1}{f}$. Power of a lens is inversely proportional to its focal length therefore lens having focal length of 20 cm will provide more convergence.

28. When two plane mirrors are placed at right angle to each other then the incident and reflected rays will always be parallel to each other.

29. **Hint—**

(i)   (ii)
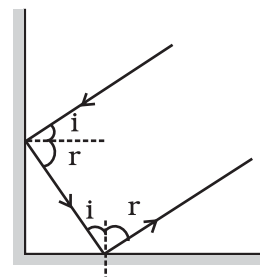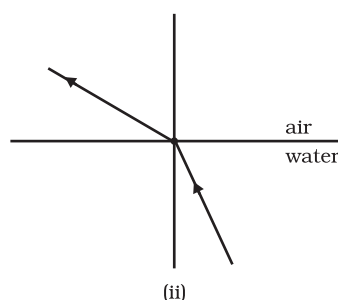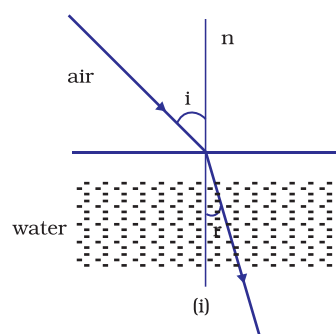
Long Answer Questions

30. **Hint—** Draw ray diagrams separately indicating the direction of incident and reflected rays.

31. **Hint—** Draw ray diagrams separately indicating the direction of incident.

32. **Hint—** Draw ray diagrams indicating the direction of incident, refracted and emergent rays and explain.

33. **Hint—** Draw ray diagrams separately indicating the direction of incident and refracted rays.

34. **Hint—** Draw ray diagrams indicating the direction of incident ray and reflected ray.

35. **Hint—** $m = -\dfrac{v}{u} = -3$, using $\dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{f}$ calculate u.

    $u = -\dfrac{80}{3}$ cm, image is real and inverted. The lens is convex.

36. $m = \dfrac{1}{3}$. Using $\dfrac{1}{v} + \dfrac{1}{u} = \dfrac{1}{f}$ calculate u; $u = -80$ cm. Image is real and inverted. Mirror is concave.

37. Hint — $P = \dfrac{1}{f}$ where f is in metre. Its unit is Dioptre. Lens is convex in the first case and concave in the second case. Power is equal to 2 dioptre in the first case and –2 dioptre in the second case.

38. Hint—

(i) Focal length = $\dfrac{38}{2}$ = 19 cm

(ii) The image will be formed at infinity

(iii) Virtual and erect

(iv)