# CHAPTER 10

## ANSWERS

#### Multiple Choice Questions

1.	(a)	2.	(b)	3.	(c)	4.	(a)
5.	(a)	6.	(a)	7.	(d)	8.	(a)
9.	(a)	10.	(b)	11.	(b)	<b>12</b> .	(b)
<b>13</b> .	(d)	14.	(b)	15.	(d)	<b>16</b> .	(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** 
$$n = \frac{c}{v}$$
  
 $n_{21} = \frac{v_1}{v_2}$ 

**24. Hint**—  $n_{dg} = \frac{v_g}{v_d} = 1.6$ ,  $n_g = \frac{c}{v_g}$ , and  $n_d = \frac{c}{v_d}$ 

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

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.**  $P = \frac{1}{f}$ ,  $P \propto \frac{1}{f}$ . 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.



#### 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**— 
$$m = -\frac{v}{u} = -3$$
, using  $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$  calculate *u*.

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

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



**37. Hint** —  $P = \frac{1}{f}$  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 =  $\frac{38}{2}$  = 19 cm
- (ii) The image will be formed at infinity
- (iii) Virtual and erect

