

**Class: X**  
**Subject: physics**  
**Topic: Light**  
**No. of Questions: 20**  
**Duration: 60 Min**  
**Maximum Marks: 60**

1. We can see objects because of \_\_\_\_\_

- A. reflection
- B. refraction
- C. transmission
- D. diffraction

**Ans. A**

2. As you move an object away from a convex mirror, its image becomes \_\_\_\_\_ and moves towards \_\_\_\_\_

- A. smaller, infinity
- B. smaller, focus
- C. enlarged, infinity
- D. enlarged, focus

**Ans. B**

3. For a plane mirror, magnification (m)= \_\_\_\_\_

- A. 0
- B. 1
- C.  $\pm 1$
- D.  $\leq 0$

**Ans. B** (image is of the same size as the object)

4. Magnification for convex mirror is \_\_\_\_\_.

- A. always positive
- B. always negative
- C. sometimes positive
- D. 1

**Ans. A** (always forms erect image)

5. Image formed by a concave mirror is erect and enlarged. What is the position of the object?

- A. Between focus F and the center of curvature
- B. At the center of curvature
- C. Beyond the center of curvature
- D. Between pole and the focus

**Ans. D**

6. A boy is standing at a distance of 2 m in front of a plane mirror. The distance between the boy and his image is \_\_\_\_\_ m.

- A. 4
- B. 3
- C. 2
- D. 1

**Ans. A** (2+2)

7. Which of the following has the highest refractive index?

- A. Glass
- B. Water
- C. Pearl
- D. Diamond

**Ans. D**

8. Absolute refractive index of any medium is always \_\_\_\_\_.

- A. 1
- B.  $> 1$
- C.  $< 1$
- D. 0

**Ans. B**

9. The refractive index of a rarer medium with respect to a denser medium is...

- A. 1
- B. greater than 1

- C. smaller than 1
- D. negative

Ans. C

10. If magnification is +1.5, the image is\_\_\_\_\_.

- A. erect
- B. diminished
- C. real
- D. inverted

Ans. A

11. Magnification for \_\_\_\_\_ image is always \_\_\_\_\_.

- A. real, positive
- B. real, negative
- C. virtual, negative
- D. any, negative

Ans. B

12. The refractive index of water with respect to air is 1.33. The velocity of light in vacuum is  $3 \times 10^8$  m/s. Calculate the velocity of light in water.

- A.  $2.25 \times 10^8$  m/s.
- B.  $2.50 \times 10^8$  m/s.
- C.  $1.50 \times 10^8$  m/s.
- D.  $1.33 \times 10^8$  m/s.

Ans. A (Absolute refractive index of water =

$$\frac{\text{Velocity of light in vacuum}}{\text{Velocity of light in water}}$$

13. A ray of light enters from water to glass. Refractive index of glass with respect to water is 1.12. Find absolute refractive index of water if absolute refractive index of glass is 1.5.

- A. 1.34
- B. 1.32
- C. 1.30
- D. 1.50

**Ans. A** (Absolute refractive index of water,  $\eta_1 = ?$ )

Absolute refractive index of glass,  $\eta_2 = 1.5$

$$\eta_{21} = 1.12 \text{ (given)}$$

$$\therefore \eta_2/\eta_1 = 1.12$$

$$\therefore \eta_1 = \eta_2/1.12$$

$$\therefore \eta_1 = (1.5)/(1.12) = 1.34$$

Hence, absolute refractive index of water = 1.34)

14. A swimmer lights a torch under sea water. Light from the torch is incident on water surface in such a way that incident light makes an angle of  $37^\circ$  with water surface. Find the angle of refraction if absolute refractive indices of water and air are 1.33 and 1.0 respectively. (Given:  $\sin 53 = 0.8$ ,  $\cos 53 = 0.6$ ,  $\sin 37 = 0.6$ ,  $\cos 37 = 0.8$ ,  $\sin 45 = \cos 45 = 1/(\text{under root } 2)$ )

- A.  $37^\circ$
- B.  $53^\circ$
- C.  $45^\circ$
- D.  $60^\circ$

**Ans. B** ( $\sin 37/\sin x = 1/1.33$  ; find  $\sin x$  and compare the value with the given values to get the value of angle)

15. An object is placed at 30 cm in front of a convex lens of focal length 20 cm. Find the position of the image.

- A. 30cm
- B. -30cm
- C. 60cm
- D. -60cm

**Ans. (f=20, u=-30)**

16. At what distance the object should be placed so that the image will be formed at a distance 10 cm from a concave lens? Focal length of the lens is 20 cm.

- A. the object should be placed 20 cm from the concave lens on the right side of the lens.
- B. the object should be placed 20 cm from the concave lens on the left side of the lens.
- C. the object should be placed 40 cm from the concave lens on the right side of the lens.
- D. the object should be placed 40 cm from the concave lens on the left side of the lens.

**Ans. B** ( $v=-10$ ,  $f=-20$ , use lens formula)

17. Rays of light are entering from glass to glycerin. If the absolute refractive index of glass is 1.5 and that of glycerin is 1.47 then find the refractive index of glycerin with respect to glass.

- A. 0.98
- B. 1.33
- C. 1.45
- D. 1.60

**Ans. A** (RI of glycerine with respect to the glass = Absolute refractive index of glycerin/Absolute refractive index of glass)

18. Rays of light are entering from air to water. If the angle of incidence at the surface separating two mediums is  $70^\circ$ , find the sine of the angle of refraction of light in water. Absolute refractive index of water is 1.33.

- A. 0.6065
- B. 0.7065
- C. 0.5065
- D. 0.8065

**Ans. B** (RI for air =1 and for water is 1.33. Use,  $\sin(70)/\sin x = 1.33/1$  ; Find  $\sin x$ )

19. Find the power of a convex lens with focal length 0.4 m

- A. 25 D
- B. -25 D
- C. 2.5 D
- D. -2.5 D

**Ans. C** (Power for the convex lens is +ve)

20. If an object of height 10 cm is placed at distance of 12 cm from a concave mirror having focal length 24 cm, find the position of the image.

- A. 40 cm
- B. -40 cm
- C. -24 cm
- D. 24 cm

**Ans. D** ( $u=-12$ ,  $f=-12$ , use the mirror formula)