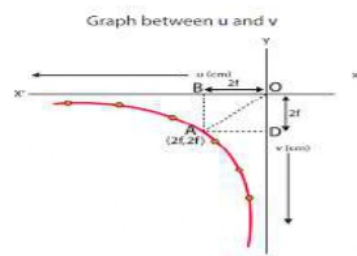


Assignment 1 –ANSWER KEY

1. Frequency
2. The ratio of sine of the angle of incidence to sine of the angle of refraction is a constant, called the refractive index of second medium with respect to first medium
3. Refractive index $n = \frac{\text{speed of light in vacuum}}{\text{speed of light in medium}} = \frac{c}{v}$
4. Convex mirror
5. Rays parallel and close to the principal axis (paraxial rays) after reflection at a concave mirror actually converge to a fixed point on the principal axis. This fixed point is called as the principal focus.

6. $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$



7. The relation connecting image distance (v), object distance (u) and focal length (f) of a mirror is $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$
8. For a mirror $f = \frac{R}{2}$, the focal length is independent of the wavelength or colour of incident light.
9. Angle of incidence = angle of reflection
The incident ray, reflected ray and the normal at the point of incidence all lie on the same plane.
10. Refractive index of second medium w r to first medium
(air) $= \frac{\text{speed of light in medium 1}}{\text{speed of light in medium 2}} = \frac{3 \times 10^8}{2 \times 10^8} = 1.5$
11. Frequency $f = \frac{c}{\lambda} = \frac{3 \times 10^8}{5 \times 10^{-7}} = 6 \times 10^{14} \text{ Hz}$
12. In vacuum, velocity of every wavelength is same. Hence ratio is 1:1
13. $n = \frac{c}{v}$, since $v < c$, n cannot be less than one.
14. Total internal reflection
15. The angle of incidence in the denser medium for which the angle of refraction becomes 90° .

16. Critical angle $C = \sin^{-1}\left(\frac{1}{n}\right)$, n is the absolute refractive index of denser medium
17. To transmit light signals from one place to another without any loss of intensity.
18. Critical angle $C = \sin^{-1}\left(\frac{1}{n}\right)$ or $n = \frac{1}{\sin C} = \frac{1}{\sin 30} = 2$
 also $n = \frac{c}{v}$, $v = \frac{c}{n} = \frac{3 \times 10^8}{2} = 1.5 \times 10^8 \text{ m/s}$
19. The relation connecting image distance (v), object distance (u) and focal length (f) of a lens is $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$
20. It is the reciprocal of focal length of the lens in metres. $P = \frac{1}{f}$
 S I unit is dioptre

ANSWERS TO MCQ

21. a) Difference between apparent and real depth of a pond
22. a) 10cm
23. d) Infinity
24. a) $A + d_m = 2i$
25. $1.5 \times 10^8 \text{ m/s}$
26. a) Decreases
27. d) Infinity
28. b) Intensity of image is halved
29. c) Convex lens and Concave mirror
30. a) Straight line
31. a) 0°
32. c) 1D
33. $1 < n < 1.3$
34. b) Nearer to the lens
35. a) convergent lens of focal length 100cm

ASSERTION AND REASON

36. b 37. D 38. C 39. D 40. D 41. A 42. C 43. B 44. C 45. a