

Holiday Home Work

Class: X

SUBJECT: PHYSICS

ANSWER THE FOLLOWING

1. A convex lens of focal length 15cm. Forms an image 10cm away from the lens. Calculate how far the object is placed from the lens. Also draw a ray diagram to show the image formed in this case.
2. A 4.0cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 0.1m. The distance of the object from the lens is 150mm. Find the nature, position and height of the image formed.
4. Define one dioptre power of a lens. Find the power of a concave lens of focal length 2m.
5. What is meant by absolute refractive index of a given medium? On what two factors does the value of refractive index for a given pair of media depend?
6. With respect to air, the refractive index of glass is $\frac{3}{2}$ and water is $\frac{4}{3}$. Calculate refractive index of water with respect to glass.
7. Which type of lens has a negative focal length? What is the power of a concave lens of focal length -20cm?
8. A concave lens of focal length 20cm forms an image 10 cm away from the lens. A) Calculate how far is the object placed from the lens. B) Draw ray diagram to illustrate the image formed in this case.
9. a) State laws of refraction. b) The refractive index of a medium 'a' with respect to 'b' is $\frac{2}{3}$ and refractive index of medium 'b' with respect to 'c' $\frac{4}{3}$. What is the refractive index of medium 'c' to 'a'.
10. Define refractive index of a transparent medium? What is the unit? Which has a higher refractive index, glass or water?
11. A ray of light travelling in air obliquely into water. Does the light ray bend towards or away from the normal? Draw a ray diagram to show the refraction of light in this medium.
12. The refractive index of diamond is 2.42. What is the meaning of this statement?
13. Name a liquid whose density is less than that of water but it is optically denser than water.
14. One half of a convex lens is covered with a black paper. Will such a lens produce an image of the complete object? Support your answer with a ray diagram.
15. An object 5 cm. high is held 25 cm. away from a converging lens of focal length 10 cm. a) Draw a ray diagram b) Calculate the position and size of the image formed. C) What is the nature of the image?
- 16 a) If the image formed by a lens is diminished in size and erect for all positions of the object what type of a lens is it?
b) Name the point on the lens through which a ray of light passes undeviated.