

**1 Mark questions**

**1. Write the lens Maker's formula and explain the terms in it**

**Ans:**  $\frac{1}{f} = (n - 1)(1/R_1 - 1/R_2)$

f= Focal length of the lens

n= Refractive index of the lens

R<sub>1</sub>, R<sub>2</sub>= Radii of curvatures of two surfaces of the lens

**2. Can a virtual image be photographed by a camera?**

**Ans:** Yes

**3. A man wants to get a picture of a zebra. He photographed a white donkey after fitting a glass, with black stripes on to the lens of his camera. What photo will get? Explain.**

**Ans:** He will get a photograph of white donkey with low intensity. This is because the reflected light from the donkey enters the lens of the camera through the openings of the stripes and form the full image.

**4. Suppose you are inside the water in a swimming pool near the edge. A friend is standing on the edge. Do you find your friend taller or shorter than his usual height? Why**

**Ans:** My friend appears to be taller. Because the light ray bend towards normal, when light ray travels from rarer medium to denser medium.

**5. Write the rules to draw ray diagrams for image formation by lenses.**

**Ans:** i) Select a point on the object placed at a point on the principal axis. ii) Draw two rays that were chosen by you from rays mentioned. iii) Extend both rays to intersect at a point. This point gives position of the image. iv) Draw a normal from point of intersection to the principal axis. v) Length of this normal represents the size of the image.

**6. Can you find the minimum limiting object distance for obtaining a real image?**

**Ans:** Yes, this minimum limiting object distance is called focal length

**7. Could you get an image on the screen for every object distance with a convex lens?**

**Ans:** No, when the object is placed between O and F we will get virtual, erect and enlarged image on the other side of the object

**8. Why don't you get an image for certain object distances?**

**Ans:** Because at those distances the light rays diverge each other

**9. Mahesh tells Vijay that the double convex lens behaves like a convergent lens. But Vijay knows that Mahesh's assertion is wrong and corrected Mahesh by asking some questions.**

**What are the questions asked by Vijay?**

**Ans:** i) What are the characteristics of image when object is kept between O and F?

ii) If the refractive index of medium is greater than that of the lens, then how does the lens behave?

iii) At what position does a convex lens behave as a divergent lens?

iv) How do air bubbles in water behave?

**10. Write the relation between refractive indices of two media, object distance, image distance and radius of curvature?**

**Ans:**  $n_2/v - n_1/u = (n_2 - n_1)/R$

**11. Write the place of image (Type of image and characteristics) if object is placed at the centre of curvature.**

**Ans:** At centre of curvature. Real, inverted and same size of the image (Convex lens)

Between O and F. Virtual, erect and diminished image (Concave lens)