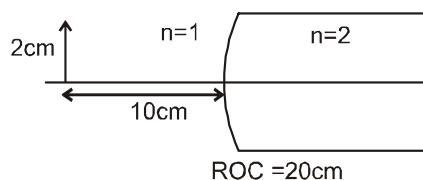
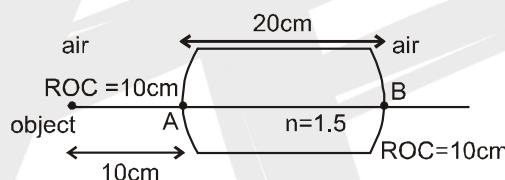


## DPP 05

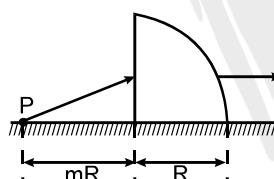
1. An extended object of size 2 cm is placed at a distance of 10 cm in air ( $n = 1$ ) from pole, on the principal axis of a spherical curved surface. The medium on the other side of refracting surface has refractive index  $n = 2$ . Find the position, nature and size of image formed after single refraction through the curved surface.



2. A point object lies inside a transparent solid sphere of radius 20 cm and of refractive index  $n = 2$ . When the object is viewed from air through the nearest surface it is seen at a distance 5 cm from the surface. the apparent distance of object when it is seen through the farthest curved surface is  $2\alpha$ . The value of  $\alpha$  is .
3. An object is placed 10 cm away from a glass piece ( $n = 1.5$ ) of length 20 cm bounded by spherical surfaces of radii of curvature 10 cm. the position of final image formed after two refractions at the spherical surfaces is  $2 \times 5^{\gamma-1}$ . Value of  $\gamma$ .

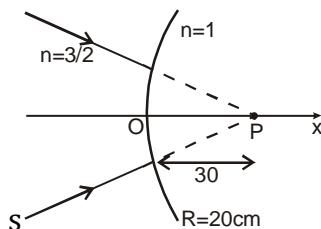


4. A quarter cylinder of radius R and refractive index 1.5 is placed on a table. A point object P is kept at a distance of  $mR$  from it. Find the value of  $m$  for which a ray from P will emerge parallel to the table as shown in the figure



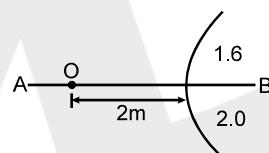
5. There is a small black dot at the centre C of a solid glass sphere of refractive index  $\mu$ . When seen from outside, the dot will appear to be located:
- away from C for all values of  $\mu$
  - at C for all values of  $\mu$
  - at C for  $\mu = 1.5$ , but away from C for  $\mu \neq 1.5$
  - at C only for  $\sqrt{2} \leq \mu \leq 1.5$ .

6. The image for the converging beam after refraction through the curved surface (in the given figure) is formed at:

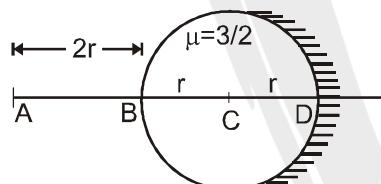


$$(A) x = 40 \text{ cm} \quad (B) x = \frac{40}{3} \text{ cm} \quad (C) x = -\frac{40}{3} \text{ cm} \quad (D) x = \frac{180}{7} \text{ cm}$$

7. In the figure shown a point object O is placed in air. A spherical boundary of radius of curvature 1.0 m separates two media. AB is principal axis. The refractive index above AB is 1.6 and below AB is 2.0. Find the separation between the images(in m) formed due to refraction at spherical surface.



8. A hemispherical portion of the surface of a solid glass sphere ( $\mu = 1.5$ ) of radius 10 cm (surrounding is air) is silvered to make the inner side reflecting. An object is placed on the axis of the hemisphere at a distance 30cm from the center of the sphere. The light from the object is refracted at the unsilvered part, then reflected from the silvered part and again refracted at the unsilvered part. What is distance (in cm) of final image from pole of reflecting surface.



**ANSWER KEY**

1. 40 cm from pole in the medium of refractive index 1, virtual, erect and 4 cm in size.  
2. 20cm 3. 50cm 4.  $m = 4/3$  5. (B) 6. (A) 7. 12  
8. 0

**Home Work**

Ex. 1	Q. 8,
Ex. 2	Q.2,3,4,
Ex.3	Q.4,8,
Ex.4	Q. 5,18
Ex.5	Q.