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SUBJECT:- PHYSICS CLASS:- XTH DATE:24/06/XX

## SUBJECT TEACHER:- MR. NEEL NIRANJAN

## **CHAPTER 4. (LIGHT)**

 A concave lens has focal length of 20 cm. At what distance from the lens a 5 cm tall object be placed so that it forms an image at 15 cm from the lens? Also calculate the size of the image formed. Answer:-

Using, 
$$h_o = 5 \text{ cm}, v = -15 \text{ cm}.$$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}, \text{ we get}$$

$$\frac{1}{u} = \frac{1}{v} - \frac{1}{f} = \frac{1}{-15} - \frac{1}{(-20)}$$

$$\frac{1}{u} = \frac{-20 + 15}{300} = -\frac{5}{300}$$

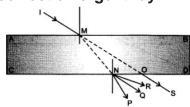
$$u = -60 \text{ cm}.$$
Since,  $m = \frac{h_l}{h_o} = \frac{v}{u}, \text{ we get}$ 

$$h_l = \frac{v}{u}. h_o = \frac{(-15)}{(-60)} \times 5$$

$$= \frac{5}{4} = 1.25 \text{ cm}.$$

Image is diminished and virtual.

2. 4. If a light ray IM is incident on the surface AB as shown, identify the correct emergent ray.



**Answer.** Ray NQ, as it has to be parallel to ray OS.