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SUBJECT:- PHYSICS

CLASS:- XTH

DATE:29/08/XX

SUBJECT TEACHER:- MR. NEEL NIRANJAN

**CHAPTER 5. (LIGHT- REFRACTION) (BASED ON NCERT PATTERN)**

**Q.1.** A convex lens forms a real and inverted image of a needle at a distance of 50 cm from it. Where is the needle placed in front of the convex lens if the image is equal to the size of the object? Also find the power of the lens.

Ans.  $\frac{1}{v} = \frac{1}{u} = \frac{1}{f}$

$v = +50$  cm. Convex lens as image is of same size hence  
 $u = -50$  cm

$$\frac{1}{f} = \frac{1}{(50 \text{ cm})} - \frac{-1}{(-50 \text{ cm})}$$

$$= \frac{1}{50} + \frac{1}{50} = \frac{1}{25} \text{ cm}$$

$$f = +25 \text{ cm} = +0.25 \text{ m.}$$

**Q.2.** A concave lens of focal length 15 cm forms an image 10 cm from the lens object placed from the lens? Draw the ray diagram.

Ans. Concave lens

$$f = -15 \text{ cm}$$

$$v = -10 \text{ cm}$$

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

$$\frac{1}{-10} - \frac{1}{u} = \frac{1}{-15}$$

$$\therefore \frac{1}{u} = -\frac{1}{30}$$

Ray diagram

