

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

POWER OF A LENS:- It is the reciprocal of focal length. Formula of power of a lens is :

$$P = \frac{1}{f \text{ (in meter)}}$$

P = Power

f = focal length

- Here P(Power) is expressed in 'D'(Dioptre)
- Focal length is expressed in 'm'(meter).
- if a lens has a focal length = 100 cm = 1 m.
- Power would be= 1 D
- **Power of a convex lens is positive.**
- **Power of a concave lens is negative.**
- **This is because the focal length of a convex lens is positive and focal length of concave lens is negative.**

Question

A person having a myopic eye uses a concave lens of focal length 50 cm. What is the power of the lens?

Focal length of a concave lens is always negative

Focal length = $f = -50$ cm

Converting to m

$$f = \frac{-50}{100} \text{ m}$$

$$f = \frac{-1}{2} \text{ m}$$

$$f = -0.5 \text{ m}$$

We know that,

$$\text{Power of a lens} = \frac{1}{\text{Focal Length}}$$

$$= \frac{1}{-0.5}$$

$$= \frac{-10}{5}$$

$$= -2 \text{ D}$$

Power of the lens is **-2 D**