

**Q4. A normal eye has retina 2 cm behind the eye-lens. What is the power of the eye-lens when the eye is**

(a) fully relaxed (b) most strained?

Solution:

(a) When lens of eyes is relaxed,

$$u = \infty$$

$$v = 0.02\text{m}$$

and

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

$$\frac{1}{0.02} - \frac{1}{\infty} = \frac{1}{f}$$

$$f = 0.02\text{m} = 50 \text{ D}$$

(b) When lens is in strained position,

$$u = -0.25$$

$$v = 0.02\text{m}$$

and

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

$$\frac{1}{0.02} - \frac{1}{-0.25} = \frac{1}{f}$$

$$f = 54\text{D}$$

$$\text{Power } P = 1/f = 54\text{D}$$