**Q3. A professor reads a greeting card received on his 50th birthday with + 2.5 D glasses keeping the card 25cm away. Ten years later, he reads his farewell letter with the same glasses but he has 'to keep the letter 50 cm away. What power of lens should he now use?**

Solution:

After 10 years,

$$f = \frac{1}{P} = -\frac{1}{2.5}$$

f= -40cm u = -50

and by lens formula

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

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

$$\frac{1}{40} + \frac{1}{-50} = \frac{1}{v}$$

v = 200cm

Now to read letter at u = -25cm and v = 200 focal length is:

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

$$\frac{1}{200} - \frac{1}{-25} = \frac{1}{f}$$

f = 2/9m

Power P = 1/f = 9/2 = 4.5 D