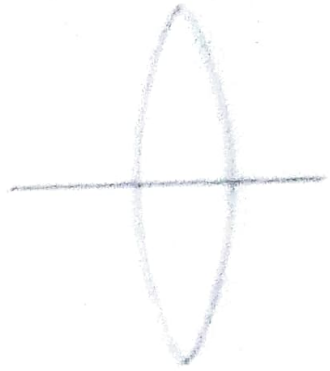
. **(b)** : The focal length of the lens is



$$\frac{1}{f_L} = (\mu - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$$\frac{1}{f_L} = (\mu - 1) \times \frac{2}{R} \; ; f_L = \frac{R}{2(\mu - 1)} \quad \ldots (i)$$

$R_1 = +R, R_2 = -R$

Now it is like a silvered lens, so f_{eq} is given by:

$$P_{eq} = 2P_L + P_m$$

$$\Rightarrow \frac{1}{f_{eq}} = \frac{1}{f_m} + \frac{2}{f_L} = \frac{2}{R} + \frac{2(\mu - 1)}{R} \times 2 \qquad \text{(Using eqn. (i))}$$

$$\frac{1}{f_{eq}} = \frac{2 + 4\mu - 4}{R} = \frac{4\mu - 2}{R} = \frac{2(2\mu - 1)}{R}$$

$$\frac{1}{f_{eq}} = \frac{1}{v} + \frac{1}{u} \text{ (As it behaves as a mirror)}$$

Here, object and image coincide,

So, $\frac{1}{f_{eq}} = \frac{1}{u} + \frac{1}{u}$ or $\frac{2}{u} = \frac{2(2\mu - 1)}{R}$ or $u = \frac{R}{2\mu - 1}$