

(b) : Given, $r_1 = 5.3 \times 10^{-11} \text{ m}$, $r_4 = 8.48 \times 10^{-10} \text{ m}$

$$mvr = \frac{nh}{2\pi}; \lambda = \frac{h}{p} = \frac{2\pi r}{n}; \lambda \propto \frac{r}{n}$$

$$\Rightarrow \frac{\lambda_1}{\lambda_4} = \frac{r_1}{r_4} \times \frac{n_4}{n_1} = \frac{5.3 \times 10^{-11}}{8.48 \times 10^{-10}} \times \frac{4}{1}; \frac{\lambda_1}{\lambda_4} = \frac{1}{4}$$

Note: None of the given options is correct. The closest option is (b).