

4. A hydrogen atom and a Li^+ ion are both in second excited state. If l_H and l_{Li} are their respective electronic angular momenta and E_H and E_{Li} their respective energies, then

(IIT JEE, 2002)

- a. $l_H > l_{\text{Li}}$ and $|E_H| > |E_{\text{Li}}|$
- b. $l_H = l_{\text{Li}}$ and $|E_H| < |E_{\text{Li}}|$
- c. $l_H = l_{\text{Li}}$ and $|E_H| > |E_{\text{Li}}|$
- d. $l_H = l_{\text{Li}}$ and $|E_H| < |E_{\text{Li}}|$

b. $L = \frac{nh}{2\pi}$, $|E| \propto Z^2/n^2$; $n = 3$

$\Rightarrow L_H = L_{Li}$ and $|E_H| < |E_{Li}|$