9. If the binding energy of the electron in a hydrogen atom is 13.6 eV, the energy required to remove the electron from the first excited state of Li^{++} is

(1) 13.6 eV (2) 30.6 eV (3) 122.4 eV (4) 3.4 eV

Solution:

B.E = $13.6 \times Z^2/n^2$, Z is the atomic number and n is the orbital quantum number. For Li^{++} , Z = 3 and n = 2 for the first excited state.

B.E = $13.6 \times 3^2/2^2$

= 30.6 ev

Hence option (2) is the answer.