7. If potential energy between a proton and an electron is given by $|U| = ke^2/2R^3$, where e is the charge of electron and R is the radius of atom, then radius of Bohr's orbit is given by (h = Planck's constant, k = constant)

a. $\frac{ke^2 m}{h^2}$

b. $\frac{6\pi^2}{n^2} \frac{ke^2 m}{h^2}$

c. $\frac{2\pi}{n} \frac{ke^2 m}{h^2}$

d. $\frac{4\pi^2 ke^2 m}{n^2 h^2}$

b. $U = -\dfrac{ke^2}{2R^3}, F = -\dfrac{dU}{dR} = -\dfrac{3ke^2}{2R^4}$

But, $F = \dfrac{mv^2}{R} \Rightarrow \dfrac{mv^2}{R} = \dfrac{3ke^2}{2R^4}$

Also, $mvR = \dfrac{nh}{2\pi}$

Solve to get: $R = \dfrac{6\pi^2 ke^2 m}{n^2 h^2}$