Ex 15.1, 15.2, 15.3 #8, 11, 14

p472

$r = 5.3 \times 10^{-11}\ m$

$$F_e = \frac{k|q_1||q_2|}{r^2} = \frac{8.99 \times 10^9 \,|1.6 \times 10^{-19}|\,|1.6 \times 10^{-19}|}{(5.3 \times 10^{-11})^2}$$

(e^-, p^+)

$$F_e = 8.2 \times 10^{-8}\ N$$

Newton's law of gravitation

$$F_g = G\frac{m_1 m_2}{r^2}$$

universal gravitation constant

$$G = 6.67 \times 10^{-11}\ \frac{N \cdot m^2}{kg^2}$$

$$= \frac{6.67 \times 10^{-11}(1.67 \times 10^{-27})(9.11 \times 10^{-31})}{(5.3 \times 10^{-11})^2}$$

$$F_g = 3.6 \times 10^{-47}\ N$$

$1q \Rightarrow 1.6 \times 10^{-19}\ C$

a charge p^+ e^-

$$F_e = k\frac{|q_1||q_2|}{r^2}$$

Coulomb's constant $8.99 \times 10^9\ \frac{Nm^2}{C^2}$

$$\frac{N \cdot m^2}{C^2}\,\frac{C \cdot C}{m^2} = N$$

table 15.1 p472

$m_e = 9.11 \times 10^{-31}\ kg$

$m_p = 1.67 \times 10^{-27}\ kg$