ALBERTA PHYSICS 30 KEY ERRATA SHEET

The following errors appear in the 2009 edition of the Physics 30 Alberta KEY. They have been corrected for future editions.

Page 50, question 38: The question asks for the radius of curvature and goes on to suggest that the answer should be abc X 10^{-d} J. The unit for the answer should be in metres (m) not joules (J).

Page 55, solution question 11 Part A: The last part of the solution should read as follows:

$$q_B = 1.51\times10^{-8}\text{ C}$$

$$\therefore q_A = (-3.50)(1.51\times10^{-8}\text{ C}) = -5.29\times10^{-8}\text{ C}$$

Since sphere A was known to have a negative charge, and the initial force was attractive, the charge on sphere B must have been positive. Therefore, sphere A initially had a charge of -5.29×10^{-8} C and sphere B initially had a charge of 1.51×10^{-8} C.

Page 56, solution question 11 Part B: The last portion of the solution from the point where the two charges are touched together should read:

$$q = \frac{q_A + q_B}{2} = \frac{(-5.29\times10^{-8}\text{ C}) + (1.51\times10^{-8}\text{ C})}{2}$$

$$\therefore q = -1.89\times10^{-8}\text{ C}$$

$$\vec{F}_e = \frac{kq_1q_2}{r^2} = \frac{kq^2}{r^2}$$

$$= \frac{(8.99\times10^{9}\text{ Nm}^2/\text{C}^2)(-1.89\times10^{-8}\text{ C})^2}{(20.0\times10^{-2}\text{ m})^2}$$

$$= 8.03\times10^{-5}\text{ N}$$

Since the two charges, after touching, are identical, the electrostatic force between them is repulsive.

Page 59, solution for question 38. The calculation for velocity is incorrect and should read:

$$\vec{v} = 1.01\times10^{6}\text{ m/s}$$

$$\vec{F_c} = \vec{F_m}$$

$$\frac{m\vec{v}^2}{r} = q\vec{v}\vec{B} \Rightarrow r = \frac{m\vec{v}}{q\vec{B}}$$

$$\therefore r = \frac{(6.65\times10^{-27}\text{ kg})(1.01\times10^{6}\text{ m/s})}{(3.20\times10^{-19}\text{ C})(6.22\times10^{-2}\text{ T})}$$

$$r = 3.37\times10^{-1}\text{ m}$$

Therefore the radius of curvature for the alpha particle in this magnetic field is 3.37×10^{-1} m.

Please add the following formulas to the data pages.

$$E_{\text{p electrical}} = \frac{kq_1q_2}{r}$$

$$E_{\text{p gravitational}} = \frac{Gm_1m_2}{r}$$