Homework Set #6 Solutions (10/6 - 10/10):

Chapter 7: **Questions** 22, 30, 33 **Exercises** 12, 15, 21

Questions:

22. At points A and B the gravitational force is doing positive work and the satellite's kinetic energy is increasing. At point C the gravitational force is doing negative work and the satellite's kinetic energy is decreasing.

30. It must be converted into thermal energy.

33. The potential energy is a maximum at either end where the pendulum bob reaches its greatest height. The kinetic energy is a maximum at the midpoint where the pendulum bob reaches its lowest height and, consequently, its lowest potential energy.

Exercises:

12. No work is performed because the gravitational force is perpendicular to the circular path.

15. a) $mg\Delta h = -(0.145\text{ kg})(10\text{ m/s}^2)(6\text{ m}) = -8.7\text{ J}$
    b) $KE_f = KE_i + Work = 8.7\text{ J} - 8.7\text{ J} = 0$
    c) $v_f = 0$

21. $P = \dfrac{\Delta E}{\Delta t} = \dfrac{W\Delta h}{\Delta t} = \dfrac{(300\text{ lb})(4\text{ ft})}{0.8\text{ s}} = (1500\text{ ft}\cdot\text{lb/s})\left[\dfrac{1\text{ hp}}{550\text{ ft}\cdot\text{lb/s}}\right] = 2.73\text{ hp}$

Chapter 11: **Questions** 5, 9 **Exercises** 3, 8

Questions:

5. Additional examples in which experimental results agree with a model strengthen our belief in it. However, a model can never be proven true. The next brown can he tries might sink.

9. Water, salt and granite are not elements as they can be separated into their constituent parts.

Exercises:

3. Oxygen is the limiting amount. Therefore, 32 g + 4(1 g) = 36 g.

8. $\# = \dfrac{1\text{ g}}{32\text{ amu}}\left[\dfrac{1\text{ amu}}{1.66\times10^{-24}\text{ g}}\right] = 1.88\times10^{22}\text{ atoms}$