ENGINEERING PHYSICS 4D3 Assignment #7 Set:
Due:

1. [Duderstadt & Hamilton 15-1]
   A thermal power reactor is shut down after an extended period of high power operation. What happens to: (a) the power output of the reactor (you may ignore the short term transients if you wish), (b) the average reactor temperature, and (c) the ability of the reactor to be restarted.

2. [Duderstadt & Hamilton 15-3]
   Determine the ratio of atomic number densities of equilibrium Xe^{135} and U^{235} as a function of the steady state thermal flux level of a reactor.

3. [Duderstadt & Hamilton 15-5]
   Demonstrate that there will be no buildup of xenon following shutdown unless the flux prior to shutdown is

$$\varphi_0 > \frac{\gamma_x}{\gamma_I}\,\frac{\lambda_x}{\sigma_a^X} \;\text{'}\; 2.7x10^{11}\ cm^{-2}\ \sec^{-1}$$

   Explain the result physically.

4. [Duderstadt & Hamilton 15-6]
   Determine the time following shutdown at which the maximum xenon concentration occurs.