

**PHYSICS 215 – Thermodynamics and Modern Physics**  
**Homework Assignment, Set #4**

1. What is the mass of  $-1$  Coulomb's worth of electrons?
2. What voltage must be used across an X-ray tube to obtain X-rays with a wavelength of  $0.12$  nm?
3. Cathode rays were eventually discovered to be:-
  - (a) positively charged particles
  - (b) negatively charged particles
  - (c) neutral particles
  - (d) neutral electromagnetic waves
4. X rays were eventually discovered to be:-
  - (a) positively charged particles
  - (b) negatively charged particles
  - (c) neutral particles
  - (d) neutral electromagnetic waves
5.  $\alpha$  rays were eventually discovered to be:-
  - (a) positively charged particles
  - (b) negatively charged particles
  - (c) neutral particles
  - (d) neutral electromagnetic waves
6. The Breslin Center can be taken to be a sphere of radius,  $R = 50$  feet. If an atom were the size of the Breslin Center, how large would the nucleus be (in cm.)?