Name: _____ Section: ____

Tuesday, September 29

Quiz 5A

A uniformly charged non-conducting sphere with radius R produces a potential of $V_0 > 0$ on the surface. Assume that the potential is zero at infinite distance from the sphere.

a. What is the total charge in the sphere?

b. "The potential is the same at any two points in the sphere." True or false? Explain.

c. A negatively charged point mass m is right outside the sphere and has a speed v_0. What is the minimum value of v_0 so the point charge can escape the attraction of the sphere?

Name: _____ Section: ____

Tuesday, September 29

Quiz 5B

A uniformly charged, non-conducting, thin spherical shell with radius R produces a potential of $V_0 > 0$ on the surface. Assume that the potential is zero at infinite distance from the shell.

a. What is the total charge in the shell?

b. "The potential at the center of the shell is zero." True or false? Explain.

d. A negatively charged point mass m is right outside the shell and has a speed v_0. What is the minimum value of v_0 so the point charge can escape the attraction of the shell?

Name: _____ Section: ____

Tuesday, September 29

Quiz 5C

A non-conducting sphere with radius R has a concentric spherical cavity with radius $R/2$. A charge $Q > 0$ is uniformly distributed throughout the object. Assume the potential is zero at infinite distance from the sphere.

a. Find the potential on the outer surface of the sphere.

b. "The potential difference between the inner and outer surfaces of this object is zero." True or false? Explain.

e. A point charge $-Q$ with mass m is right outside the shell and has a speed v_0. What is the minimum value of v_0 so the point charge can escape the attraction of the shell?.

Name: _____ Section: ____

Tuesday, September 29

Quiz 5D

Consider a thin, isolated, conducting spherical shell with radius R and charge Q. A non-conducting sphere of radius $R/2$ and uniformly distributed charge Q is concentric with the shell. Assume that the potential is zero at infinity.

a. Find the potential on the inner surface of the shell

b. Find the potential difference between the shell and the surface of the non-conducting sphere.

c. Now a point charge Q is brought to a point located at distance $2R$ from the center of the shell. Once the system has achieved equilibrium, is the surface of the conducting shell an equipotential surface? Explain.