Exam #1 Review:

Chapter 21

- Model of Charge (Q1, Q2, Q3, 1)
- $\vec{F} = q_{test}\vec{E}$ which reduces to Coulomb's Law when $\vec{E} = \vec{E}_{pt}$. (5, 9, 13, 15, 21, 23, 74, 84, 102)
- Use kinematics when acceleration is a constant, i.e. $\vec{E}$ is a "uniform field." (25, 27, 33, 41)
- Superposition of Electric Field:
  - Electric fields add as vectors (47, 50, Quiz #1)
  - Use integration to sum the electric field vectors when the charge distribution is continuous. (89, 96)

Chapter 22

- Definition of charge density: λ, σ, ρ (29, and numerous other problems.)
- Definition of flux: $\Phi = \int \vec{E} \bullet d\vec{A}$ (1, 4)
- Gauss' Law $\Phi = \oint \vec{E} \bullet d\vec{A} = Q_{enclosed} / \varepsilon_0$ (8, 13, 23, 25, 29, 37, 42, Quiz #2)
- Conductors in electrostatic equilibrium have $\vec{E} = 0$ inside the conducting material. (used in several of the Gauss' Law problems.)
- Electric fields from lines, planes, etc. add as vectors. (21, 51)

Chapter 23

- Conservation of electrical energy: $0 = \Delta U + \Delta K$ where electrical potential energy is $U = q_{test}V$ (1,5,17,27,31,35,53,65)
- Electric potentials add as scalars. (21)
- Going from V to $\vec{E}$. (45, 47, 48)
- Going from $\vec{E}$ to V. (41,72, 78)