Physics 2020 Exam 1 Summer Review Questions
Dr. Luttermoser’s Class

1. Robert Milliken made a fundamental discovery about electric charges in 1909. What was it?

2. What is the difference between conductors, semiconductors, and insulators?

3. What is meant by a conductor being grounded?


5. Describe the electric field for a proton in isolation, and electron in isolation, an electron-proton pair, and a proton-proton pair. What is the magnitude of the electric field of a point charge?

6. What is meant by electrostatic equilibrium?

7. What is the electric flux and what does it measure? What is Gauss’s law?

8. Review the summary of Chapter 15 in the textbook and learn the definition of all boldface terms in this chapter.

9. Review Examples I-1 (Problem 15.3, Coulomb’s force), I-2 (Problem 15.22, one-dimensional motion for charges), I-3 (Problem 15.24, superposition principle of E-fields), I-4 (Problem 15.28, electric field lines), and I-5 (Problem 15.39, electric flux) in the class notes. Finally, make sure you understand how to do the Supplemental Homework Problem Set 1: 1 (Problem 15.19, Coulomb’s law), 2 (Problem 15.18, superposition principle of E-fields), 3 (Problem 15.30, E-fields), and 4 (Problem 15.43, Gauss’s law).

10. What is meant by the phrase the electrostatic force is conservative? What is the work done on an electric field?

11. Define potential difference. What units is it measured in? What is the electric potential of a point charge? What is an electron volt?

12. Describe the concept of an equipotential surface. How much work is done to move a charge on an equipotential surface?

13. Define capacitance. What units is it measured in? What is the capacitance of a parallel-plate capacitor? How is Coulomb’s constant related to the permittivity of free space?

14. One can often reduce a complicated circuit to a simple circuit. How do capacitors add in a parallel circuit? And in a series circuit?

15. Describe how the internal energy of a capacitor changes as the voltage changes within it.
16. What is a dielectric? How does it affect the capacitance, charge, potential difference, and internal energy of a capacitor? Why isn’t the air a good dielectric?

17. Review the summary of Chapter 16 in the textbook and learn the definition of all boldface terms in this chapter.

18. Review Examples II-2 (Problem 16.12, superposition principle of potential), II-2 (Problem 16.23, geometric properties of capacitors), II-4 (Problem 16.35, capacitors in circuits), and II-5 (Problem 16.45, internal energy of a capacitor) in the class notes. Finally, make sure you understand how to do the Supplemental Homework Problem Set 1: 6 (Problem 16.17, superposition principle of potential), 7 (Problem 16.26, geometric properties of capacitors), and 8 (Problem 16.33, capacitors in circuits).