

Homework 05 – Rev A

SPN 5–00 [0 pts] – Van de Graf Generator.

Problem 7-49 in text. TA will do this problem as an example for Problem 50. You do not need to do problem 49.

SPN 5–01 [10 pts] – Electrostatic painting.

Problem 7-50 in text. Quite similar to 7-49.

SPN 5–02 [10 pts] – Potential of multiple point charges.

Problem 7-52 in text. Suggest each group in recitation do one of the four parts. You must submit all four answers (parts a, b, c, d) for homework.

SPN 5–03 [10 pts] – Infinite plane of charge.

Problem 7-59 in text. The infinite plane provides a uniform field. This makes the potential particularly easy to calculate!

SPN 5–04 [10 pts] – Two charged hollow spheres.

Problem 7-60 in text. This is particularly interesting, and perhaps surprising. I will discuss in class on Thursday.

SPN 5–05 [10 pts] – The Geiger Counter.

Problem 7-71 in text. You already know enough to learn how some fancy instruments work.

SPN 5–06 [10 pts] – Fusion!

Problem 7-75 in text. The basic problem of fusion is electrostatic repulsion. The energy source of fission IS electrostatic repulsion. So with a little electricity you are already nuclear engineers! Part ‘a’ of this problem should take two minutes. Part ‘b’ requires a magic formula that you have not learned yet. Let U_0 be your answer to part ‘a’. The answer to part ‘b’ is that $T = U_0/k_B$. T will come out in Kelvin (it’s millions of Kelvin). k_B is Boltzmann’s constant. $k_B = 1.38 \times 10^{-23}$ Joule/Kelvin. Plug and chug!