

Homework #5

Homework must be submitted on standard 8 ½ by 11 (inches) paper (lined or unlined). In keeping with professional standards, the paper must not have ragged edges (e.g., just torn of a spiral notebook), and multiple pages **must be stapled** together. Each homework submission must have:

1. Your Name at the TOP RIGHT of each page
2. Homework Number at the TOP RIGHT of the first page
3. Boxes drawn around all numerical and symbolic answers.

Suggested Problems: 25.8, 25.10, 25.11, 25.13, 25.19, 25.24, 25.28, 25.32, 25.33.

Assignment: due on Tuesday (6pm), 22 February 2011.

1. Problem 25.14.
2. How should four $2.0\mu\text{F}$ capacitors be connected to have a total capacitance of
 - a) $8.0\mu\text{F}$
 - b) $2.0\mu\text{F}$
 - c) $1.5\mu\text{F}$
 - d) $0.5\mu\text{F}$
3. Problem 25.15.
4. Problem 25.23.
5. Problem 25.28.
6. A 16.0 pF parallel plate capacitor is charged by a 10.0V battery. Each plate of the capacitor has an area of 5.0 cm^2 .
 - a) What is the energy stored in the capacitor?
 - b) What is the energy density (energy per unit volume) in the electric field of the capacitor if the plates are separated by air?
7. A parallel-plate capacitor has 7.15 J of energy stored in it. The separation between the plates is 1.30 mm . If the separation is decreased to 0.65 mm , what is the energy stored if
 - a) The capacitor is disconnected from the source, so the charge on the plates remains constant?
 - b) The capacitor remains connected to the potential source, so the potential difference between the plates remains constant?
8. Problem 25.27.
9. Problem 25.34.
10. Problems 25.48 and 25.49.
11. Problem 25.55.
12. Problem 25.54.