Problem Set 5 Solutions
Due: see website for due dates

Chapter 25: Capacitance
Exercises & Problems: 4, 13, 14, 19, 41, 45, 48, 57

Question A
A capacitor is connected to a power supply. (i) Explain how a charge is stored on the capacitor? (ii) Explain how a current is created in the circuit and when the current stops flowing?

Question B
The freshness of fish can be measured by placing a fish between the plates of a capacitor and measuring the capacitance. How does this work?

Question C
A dielectric is pulled from between the plates of a capacitor which remains connected to a battery. What changes occur to the capacitance, charge on the plates, potential difference, energy stored, and electric field?

Question D
Darla charges a parallel plate capacitor with the help of a battery. She then removes the battery and halves the distance between the two plates. (i) What happens to the capacitance and voltage of the capacitor? (ii) Derive and explain why halving the distance between the plates of a disconnected, charged capacitor reduces the stored energy by half?