Tuesday Reading Assessment: Unit 0 part II, Capacitance

Prof. Jordan C. Hanson

February 18, 2020

1 Memory Bank

- $Q = CV$ ... Relationship between capacitance, charge, and voltage.
- $C_{tot} = C_1 + C_2 + C_3 + ...$ ... Capacitors in parallel.

2 Capacitors

1. Consider Fig. 1. Why does each capacitor add to the total capacitance if each is connected to the battery as shown? What physical principles are working here?

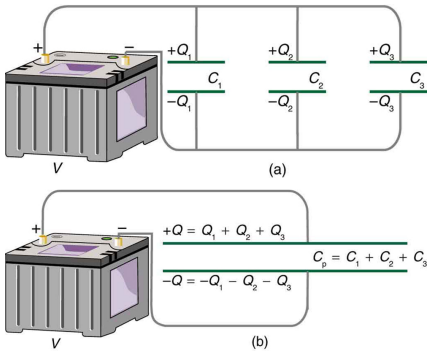

Figure 1: The relationship between potential energy and voltage.

2. Suppose C_1 is 20 pF, C_2 is 20 pF, and the total capacitance is 100 pF. What is the capacitance of C_3?

3. Suppose the total charge stored is 1 pC, and the total capacitance is 24 pF. At what voltage is the charge being stored?

4. Suppose a different system stores the same charge at half the voltage. What is true of the capacitance?
   - A: It has half the capacitance
   - B: It is the same capacitance
   - C: It is double the capacitance
   - D: It has zero capacitance