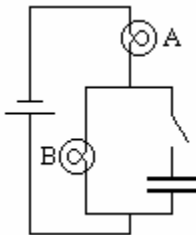


UNIT 12 EXERCISES

1) Discuss the purpose of a capacitor in a circuit. Why would you put a capacitor in a circuit? Explain.

2) (from Lillian C. McDermott, Peter S. Shaffer and the Physics Education Group, *Tutorials in Introductory Physics (Homework)*, Prentice Hall, NJ, 1998.)

Two bulbs and a capacitor are connected to a battery as shown below.



a) Just after the switch is closed:

(i) What is the potential difference across bulb A, across bulb B, across the capacitor, and across the battery? Explain.

(ii) Rank the currents through bulb A, bulb B, the capacitor, and the battery. Explain.

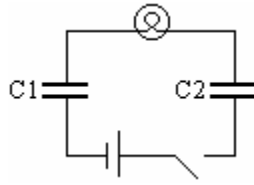
b) A long time after the switch is closed:

(i) Rank the currents through bulb A, bulb B, the capacitor, and the battery. Explain.

(ii) What is the potential difference across bulb A, across bulb B, across the capacitor, and across the battery? Explain.

c) Summarize your results by describing the behavior of bulb A and of bulb B from just after the switch is closed until a long time later.

3) Consider the two capacitors and bulb in the circuit below.



a) Just after the switch is closed:

What is the potential difference across the bulb, across the capacitor 1, and across capacitor 2? Explain.

b) A long time after the switch is closed:

What is the potential difference across the bulb, across the capacitor 1, and across capacitor 2? Explain.