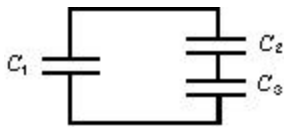
1. A battery is used to charge a series combination of two identical capacitors. If the potential difference across the battery terminals is V and total charge Q flows through the battery during the charging process then the charge on the positive plate of each capacitor and the potential difference across each capacitor are:
   A) $Q/2$ and $V/2$, respectively
   B) Q and V, respectively
   C) $Q/2$ and V, respectively
   D) Q and $V/2$, respectively
   E) Q and $2V$, respectively

2. A 2-μF and a 1-μF capacitor are connected in parallel and a potential difference is applied across the combination. The 2-μF capacitor has:
   A) twice the charge of the 1-μF capacitor
   B) half the charge of the 1-μF capacitor
   C) twice the potential difference of the 1-μF capacitor
   D) half the potential difference of the 1-μF capacitor
   E) none of the above

3. Two identical capacitors, each with capacitance C, are connected in parallel and the combination is connected in series to a third identical capacitor. The equivalent capacitance of this arrangement is:
   A) $2C/3$
   B) C
   C) $3C/2$
   D) $2C$
   E) $3C$

4. Capacitor C_1 is connected alone to a battery and charged until the magnitude of the charge on each plate is q_0. Then it is removed from the battery and connected to two other capacitors C_2 and C_3 as shown. The final charges on the capacitors are related by:



   A) $q_0 = q_1 + q_2 + q_3$
   B) $q_1 + q_2 + q_3 = 0$
   C) $q_0 = q_1$, $q_2 + q_3 = 0$
   D) $q_0 = q_1 + q_2$, $q_2 = q_3$

E) $q_0 = q_2 + q_3$, $q_1 = 0$

5. A parallel-plate capacitor has a plate area of 0.2 m^2 and a plate separation of 0.1 mm. If the charge on each plate has a magnitude of 4×10^{-6} C the electric field between the plates is approximately:
   A) 0
   B) 4×10^2 V/m
   C) 1×10^6 V/m
   D) 2×10^6 V/m
   E) 4×10^{12} V/m

Answer Key:

1. D
2. A
3. A
4. D
5. D