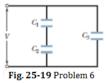


Suggested problems: Chapter 25- HRW-Principles of Physics- ISV 10th Edition.

6. In Fig. 25-19, a potential difference V = 100 V is applied across a capacitor arrangement with capacitances $C_1 = 10.0 \mu$ F, $C_2 = 5.00 \mu$ F, and $C_3 = 2.00 \mu$ F. What are (a) charge q₃,(b) potential difference V₃, and (c) stored energy U₃ for capacitor 3, (d) q₁, (e) V₁, and (f) U₁ for capacitor 1, and (g) q₂, (h) V₂, and (i) U₂ for capacitor 2?



<u>Answer:</u>(a)200 μC; (b) 100 V; (c)10.0 mJ; (d) 333 μC; (e) 33.3V; (f) 5.55mJ; (g) 333 μC; (h) 66.7V; (i) 11.1mJ

8. Figure 25-20 displays a 16.0 V battery and 3 uncharged capacitors of capacitances $C_1 = 4.00 \,\mu F$, $C_2 = 6.00 \,\mu F$, and $C_3 = 3.00 \,\mu F$. The switch is thrown to the left side until capacitor 1 is fully charged. Then the switch is thrown to the right. What is the final charge on (a) capacitor 1, (b) capacitor 2, and (c) capacitor 3?

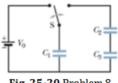
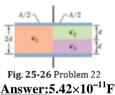


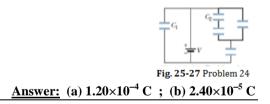
Fig. 25-20 Problem 8

<u>Answer:</u>(a) 42.7 μ C; (b) 21.3 μ C; (c) 21.3 μ C

22. Figure 25-26 shows a parallel-plate capacitor of plate area $A=12.5 \text{ cm}^2$ and plate separation 2d = 7.12 mm. The left half of the gap is filled with material of dielectric constant $k_1 = 21.0$; the top of the right half is filled with material of dielectric constant $k_2 = 42.0$; the bottom of the right half is filled with material of dielectric constant $k_3 = 58.0$. What is the capacitance?



24. In Fig. 25-27, the battery has a potential difference of V = 12.0 V and the five capacitors each have a capacitance of 10.0 μ F. What is the charge on (a) capacitor 1 and (b) capacitor 2?



32. The capacitor in Fig. 25-31 has a capacitance of 30 μ F and is initially uncharged. The battery provides a potential difference of 120 V. After switch S is closed, how much charge will pass through it?



Fig. 25-31 Problem 32

<u>Answer:</u>3.6×10⁻³C

48. How many 12.5 μF capacitors must be connected in paralell to store a charge of 33.0 mC with a potential of 110 V across the capacitors?

Answer: 24

54. The plates of a spherical capacitor have radii 37.0 mm and 40.0 mm. (a) Calculate the capacitance. (b) What must be the plate area of a parallel-plate capacitor with the same plate separation and capacitance?

<u>Answer:</u> (a) 54.9pF ; (b)186 cm²