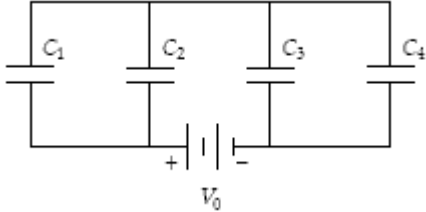


Physics 210 Week 6 Practise Multiple Choice Problems

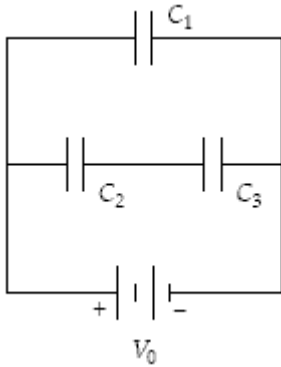
Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ____ 1. What is the total energy stored by C_3 when $C_1 = 50 \mu\text{F}$, $C_2 = 30 \mu\text{F}$, $C_3 = 36 \mu\text{F}$, $C_4 = 12 \mu\text{F}$, and $V_0 = 30 \text{ V}$?



- a. 6.3 mJ
 b. 25 mJ
 c. 57 mJ
 d. 1.6 mJ
 e. 14 mJ
- ____ 2. What is the potential difference across C_2 when $C_1 = 5.0 \mu\text{F}$, $C_2 = 15 \mu\text{F}$, $C_3 = 30 \mu\text{F}$, and $V_0 = 24 \text{ V}$?



- a. 21 V
 b. 19 V
 c. 16 V
 d. 24 V
 e. 8.0 V
- ____ 3. A $6.0\text{-}\mu\text{F}$ capacitor charged to 50 V and a $4.0\text{-}\mu\text{F}$ capacitor charged to 34 V are connected to each other, with the two positive plates connected and the two negative plates connected. What is the total energy stored in the $6.0\text{-}\mu\text{F}$ capacitor at equilibrium?
- a. 6.1 mJ
 b. 5.7 mJ
 c. 6.6 mJ
 d. 7.0 mJ
 e. 3.8 mJ

- _____ 4. A $25\text{-}\mu\text{F}$ capacitor charged to 50 V and a capacitor C charged to 20 V are connected to each other, with the two positive plates connected and the two negative plates connected. The final potential difference across the $25\text{-}\mu\text{F}$ capacitor is 36 V . What is the value of the capacitance of C ?
- $43\ \mu\text{F}$
 - $29\ \mu\text{F}$
 - $22\ \mu\text{F}$
 - $58\ \mu\text{F}$
 - $63\ \mu\text{F}$
- _____ 5. A $30\text{-}\mu\text{F}$ capacitor is charged to 80 V and then connected across an initially uncharged capacitor of unknown capacitance C . If the final potential difference across the $30\text{-}\mu\text{F}$ capacitor is 20 V , determine C .
- $60\ \mu\text{F}$
 - $75\ \mu\text{F}$
 - $45\ \mu\text{F}$
 - $90\ \mu\text{F}$
 - $24\ \mu\text{F}$
- _____ 6. A parallel plate capacitor of capacitance C_0 has plates of area A with separation d between them. When it is connected to a battery of voltage V_0 , it has charge of magnitude Q_0 on its plates. The plates are pulled apart to a separation $2d$ while the capacitor remains connected to the battery. After the plates are $2d$ apart, the capacitance of the capacitor and the magnitude of the charge on the plates are
- $\frac{1}{2}C_0, \frac{1}{2}Q_0$
 - $\frac{1}{2}C_0, Q_0$
 - C_0, Q_0
 - $2C_0, Q_0$
 - $2C_0, 2Q_0$
- _____ 7. A parallel plate capacitor of capacitance C_0 has plates of area A with separation d between them. When it is connected to a battery of voltage V_0 , it has charge of magnitude Q_0 on its plates. It is then disconnected from the battery and the space between the plates is filled with a material of dielectric constant 3. After the dielectric is added, the magnitudes of the charge on the plates and the potential difference between them are
- $\frac{1}{3}Q_0, \frac{1}{3}V_0$.
 - $Q_0, \frac{1}{3}V_0$.
 - Q_0, V_0 .
 - $Q_0, 3V_0$.
 - $3Q_0, 3V_0$.
- _____ 8. A light bulb is rated at 30 W when operated at 120 V . How much charge enters (and leaves) the light bulb in 1.0 min ?
- 17 C
 - 15 C
 - 14 C
 - 13 C
 - 60 C

- _____ 9. A wire (length = 2.0 m, diameter = 1.0 mm) has a resistance of 0.45Ω . What is the resistivity of the material used to make the wire?
- $5.6 \times 10^{-7} \Omega \cdot \text{m}$
 - $1.2 \times 10^{-7} \Omega \cdot \text{m}$
 - $1.8 \times 10^{-7} \Omega \cdot \text{m}$
 - $2.3 \times 10^{-7} \Omega \cdot \text{m}$
 - $7.1 \times 10^{-7} \Omega \cdot \text{m}$
- _____ 10. A conductor of radius r , length ℓ and resistivity ρ has resistance R . What is the new resistance if it is stretched to 4 times its original length?
- $\frac{1}{16}R$
 - $\frac{1}{4}R$
 - R
 - $4R$
 - $16R$

Answer Section

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: A | PTS: 1 |
| 2. ANS: C | PTS: 1 |
| 3. ANS: B | PTS: 1 |
| 4. ANS: C | PTS: 1 |
| 5. ANS: D | PTS: 1 |
| 6. ANS: A | PTS: 1 |
| 7. ANS: B | PTS: 1 |
| 8. ANS: B | PTS: 1 |
| 9. ANS: C | PTS: 1 |
| 10. ANS: E | PTS: 1 |