Assignment 6

1. Find the capacitance per unit length of a parallel-plate capacitor with a width of 1 cm and a separation of 0.5 mm.

2. A capacitor consists of two plates with areas of 40 cm² and a separation of 0.2 mm. Calculate the capacitance if the dielectric constant is 3.5.

3. Determine the electric field between two charged parallel plates if the potential difference is 120 V and the separation is 2 mm.

4. For a capacitor with a capacitance of 500 µF and a potential difference of 12 V, calculate the charge on each plate.

5. A capacitor is charged to a potential of 200 V and then discharged through a resistor of 1000 Ω. Calculate the energy dissipated in the resistor if the discharge lasts for 0.2 s.

6. A capacitor of 0.01 µF is connected to a battery of 10 V. Calculate the charge on the capacitor after 1 s.

7. A capacitor with a capacitance of 200 µF is charged to 100 V and then connected in parallel with another capacitor of 500 µF. Calculate the potential difference across each capacitor.

8. A capacitor of 100 µF is charged to 50 V and then discharged through a resistor of 1000 Ω. Calculate the maximum current that will flow.

9. A capacitor is charged to a potential difference of 100 V and then connected in series with another capacitor of 500 µF. Calculate the potential difference across each capacitor.

10. A capacitor of 1.0 µF is charged to 10 V and then connected to a transistor as a bypass capacitor. Calculate the maximum current that will flow.

11. A capacitor of 0.1 µF is charged to 100 V and then discharged through a resistor of 1000 Ω. Calculate the time constant of the circuit.

12. A capacitor of 0.01 µF is charged to 100 V and then connected in parallel with another capacitor of 0.05 µF. Calculate the charge on each capacitor after 1 s.

13. A capacitor of 100 µF is charged to 50 V and then connected in parallel with another capacitor of 500 µF. Calculate the potential difference across each capacitor.

14. A capacitor of 0.01 µF is charged to 100 V and then connected to a transistor as a bypass capacitor. Calculate the maximum current that will flow.

15. A capacitor of 0.1 µF is charged to 100 V and then discharged through a resistor of 1000 Ω. Calculate the time constant of the circuit.

16. A capacitor of 0.01 µF is charged to 100 V and then connected in parallel with another capacitor of 0.05 µF. Calculate the charge on each capacitor after 1 s.

17. A capacitor of 100 µF is charged to 50 V and then connected in parallel with another capacitor of 500 µF. Calculate the potential difference across each capacitor.