What is a Capacitor?

Worksheet

Capacitance measures a capacitor's ability to store charge per unit of voltage: C = Q/V, measured in farads (F). Larger plate area, smaller plate separation, and a stronger dielectric all increase capacitance.

$$Q = CV$$

Questions

1. A capacitor stores 50 C at 5V. What is its capacitance?

A) 10 F
B) 250 F
C) 0.1 F
D) 55 F

2. What is the unit of capacitance?

A) Ohm
B) Henry
C) Farad
D) Watt

3. What is the formula for energy stored in a capacitor?

A) E = CV
B) E = 0.5CV
C) E = C/V
D) E = QV

4. Doubling the plate separation does what to capacitance (all else equal)?

A) Doubles it
B) Halves it
C) No change
D) Quadruples it

5. A capacitor stores 200 C of charge at 20V. Find its capacitance.

6. A 5 F capacitor is charged to 12V. Find the stored charge.

7. Find the energy stored in a 4 F capacitor charged to 10V.

8. Define: What is capacitance?

9. Define: What is the unit of capacitance?

10. Define: Formula for energy stored in a capacitor?

Answer Key

1. A) 10 F - C = Q/V = 50/5 = 10 F.
2. C) Farad - Capacitance is measured in farads (F).
3. B) E = 0.5CV - Energy stored is E = 0.5 C V.
4. B) Halves it - Capacitance is inversely proportional to plate distance, so doubling it halves C.
5. C = Q/V C = 200 C / 20 V C = 10 F
6. Q = C V Q = 5 F 12 V Q = 60 C
7. E = 0.5 C V E = 0.5 410 10 E = 0.5 410 100 = 210 J = 200 J
8. A capacitor's ability to store charge per unit voltage, C = Q/V, measured in farads.
9. The farad (F); practical values are often microfarads (F), nanofarads (nF), or picofarads (pF).
10. E = 0.5 C V