

27 Lecture - PHY101

Important Subjective

What is the definition of capacitance?

Answer: Capacitance is the ability of a capacitor to store electric charge per unit voltage.

Define the time constant of a capacitor.

Answer: The time constant of a capacitor is the time taken by the capacitor to discharge to 63.2% of its initial charge or voltage.

What is the energy stored in a capacitor?

Answer: The energy stored in a capacitor is given by the formula: $E = \frac{1}{2} CV^2$, where E is the energy stored, C is the capacitance, and V is the voltage across the capacitor.

What happens when a capacitor is connected in series with a resistor and a battery?

Answer: A capacitor connected in series with a resistor and a battery forms a simple RC circuit, where the capacitor charges and discharges through the resistor.

Define the current in a capacitor.

Answer: The current in a capacitor is the rate of change of charge stored in the capacitor with respect to time.

What is the unit of capacitance?

Answer: The unit of capacitance is farad (F).

How can you increase the capacitance of a capacitor?

Answer: The capacitance of a capacitor can be increased by increasing the area of the plates, decreasing the distance between the plates, or by using a material with a high dielectric constant between the plates.

What is the charge on a capacitor when it is fully charged?

Answer: The charge on a capacitor when it is fully charged is equal to the product of its capacitance and the voltage across it.

What is the difference between a capacitor and a battery?

Answer: A capacitor stores energy in an electric field, while a battery stores energy in a chemical form.

What is the formula for the time constant of a capacitor in an RC circuit?

Answer: The formula for the time constant of a capacitor in an RC circuit is given by the product of the resistance and the capacitance, i.e., $\tau = RC$.