

# 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.,  $\tau = RC$ .