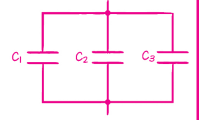


SERIES



5. ELECTROSTATIC POTENTIAL & CAPACITANCE

PARALLEL



IMP DEFINITIONS & FORMULAS

ELECTROSTATIC POTENTIAL

- Electrostatic potential** is the work done in bringing a unit positive charge from infinity to a point. $V = W/q$ Its SI unit is volt (V).
- Electric potential due to a point charge is

$$V = \frac{1}{4\pi\epsilon_0} \frac{Q}{r}$$
- Electric potential energy of two point charges is

$$U = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r_{12}}$$
- Electric potential energy of a dipole in a uniform electric field is $U = -pE \cos \theta = -\vec{p} \cdot \vec{E}$

CAPACITANCE

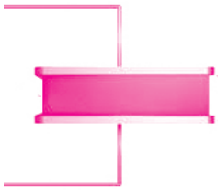
- Capacitance** is the ability of a body to store electric charges. The device which stores electric charges is called capacitor. Capacitance of a capacitor $C = Q/V$ Its SI unit is farad (F).
- Capacitance of a parallel plate capacitor is

$$C = \frac{\epsilon_0 A}{d}$$
- For parallel combination of capacitors,** $Q \propto C$ and V is same.
 - Equivalent capacitance of 2 capacitors in parallel is $C = C_1 + C_2$
- For series combination of capacitors,** Q is same and $V \propto \frac{1}{C}$
 - Equivalent capacitance of 2 capacitors in series is given by $\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2}$

BULLET MASTER'S

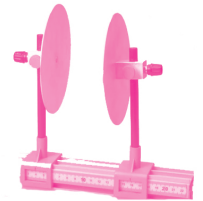
PHYSI BEATS!

5) ELECTROSTATIC POTENTIAL & CAPACITANCE [1 SAQ]



Kinematics లో Work లాంటిదే

Electricity లో Electrostatic Potential అనే Concept



- 'Electrostatic Potential' measures the ability to perform the work on a charge.
- 'Electrostatic potential energy' is a measure of the strength of the nearby charges
- ఇంటి పైన ఉండే Water Tank లో ఎంత Max. Water Store చేయగలమో అదే ఆ ట్యాంక్ Capacity (500L, 1000L) ఒక Capacitor లో ఎంత Electric Charge store చేయగలమో అదే దాని Capacitance (F)
 - Capacitance** measures the **ability to store charge**.
- Batteries convert Chemical energy into Electrical energy whereas capacitors store energy.
 - Capacitors (i) draw energy from a battery and stores energy.
 - (ii) charge and discharge electric energy.
 - (iii) keep voltage at the same level.

IPE View

IMP SAQ: Electric Potential due to point charge,
Equivalent capacitance in series and parallel combination of capacitors.