

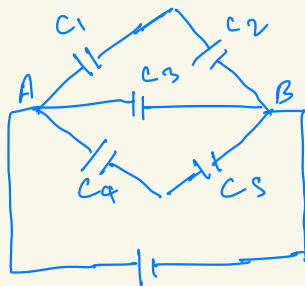
Test - 04

09-06-2024 [Sunday] - 11 AM.

Total Marks - 20.

1) Find the equivalent capacitance - b/w the point A & B.

$$C_1 = C_2 = C_3 = C_4 = C_5 = 4 \mu\text{F}$$

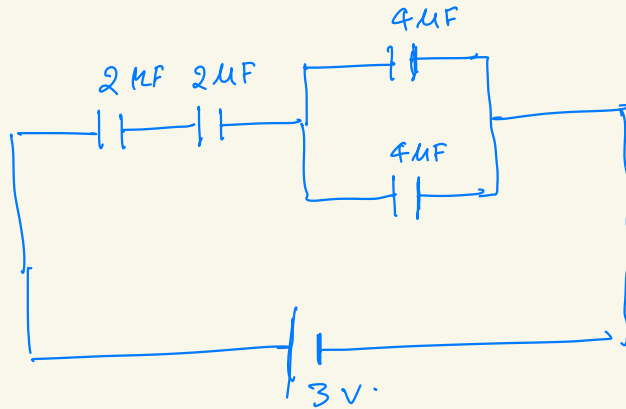


2) Assuming the earth as an insulated spherical conductor of radius 6400 km. Calculate its capacitance.

3) A parallel plate capacitor has a plate area of  $2 \text{ m}^2$  & a plate separation of  $0.01 \text{ m}$ . The dielectric constant of the material b/w the plate is 5. Calculate the capacitance of the conductor.

4) A parallel plate capacitor with a capacitance of  $5 \mu\text{F}$  is charged to a potential difference of  $1000 \text{ V}$ . Calculate the charge on each plate of the capacitor.

5) Find the equivalent capacitance b/w A & B.



6) A  $900\text{ pF}$  capacitor is charged by a  $100\text{ V}$  battery. How much energy is stored by the capacitor?

7) A parallel plate capacitor of plate area  $A = 600\text{ cm}^2$  and plate separation  $d = 2\text{ mm}$  is connected to a DC source of  $200\text{ V}$ . Calculate in SI unit:

(i) the magnitude of the uniform electric field  $E$  b/w the plates

(ii) the charge density  $\sigma$  on the plate.

8) Deduce an expression for equivalent capacitance  $C$  when three capacitors  $C_1$ ,  $C_2$  &  $C_3$  are connected in parallel.