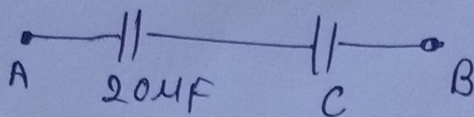


11. State Gauss' Law in Electrostatics. Using this Law derive an expression for the Electric field due to a long straight wire of density  $\lambda$  c/m.

12. The equivalent capacitance of the combination between points A and B in the given figure is  $4 \mu\text{F}$



- (i) Calculate the capacitance of a capacitor  $C$
- (ii) Calculate the charge on each capacitor if a  $12\text{V}$  battery is connected across terminals A and B.

Section D (4 mark each)

13. Explain using suitable diagrams, the difference in the behaviour of a conductor and dielectric in the presence of external electric field. Define the term polarisation of a dielectric.

14. (i) Deduce the expression for the energy stored in a capacitor of capacitance  $C$  with charge  $Q$ .

(ii) What is Energy density of a capacitor.