ELECTRICAL MEASUREMENT & MEASURING INSTRUMENTS

UNIT 3

Measurement of Parameters

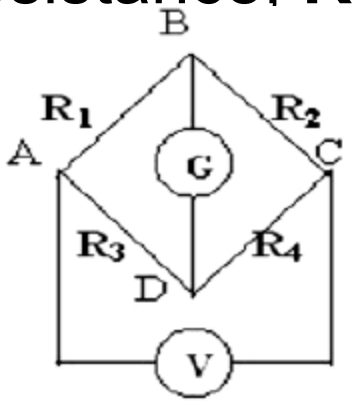
MEASUREMENT OF MEDIUM RESISTANCES

Volt-Ampere Method

- Here an ammeter and a voltmeter are used respectively in series and in parallel with the resistor under measurement.
- Resistances are obtained for each trial as per ohmic-principle, using equation R = V/I.
- The average value of all the trails will give the measured value of resistance.
- This method is also referred as the potential drop method or VA method.
- Here, the meter ranges are to be chosen carefully based on the circuit conditions and the resistance value to be obtained.
- This method suffers from the ***connection errors.***

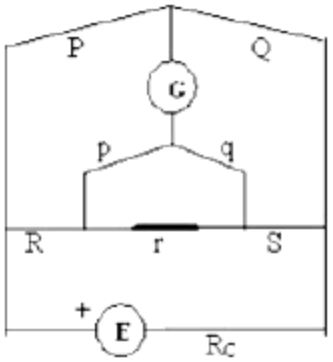
Wheatstone's bridge

- The bridge is said to be balanced when the galvanometer current is
- Solving further, we get, R1/R2 = R3/ R4 and ***R1R4 = R2R3***
- ***This is the balance equation of the bridge.***
- Thus, unknown resistance. **R3 = R1R4/ R2** ohms.zero.



MEASUREMENT OF LOW RESISTANCES

- **Kelvin's Double Bridge**
- Kelvin's Double Bridge (KDB) is the most widely used method



- The balance equation of KDB can be derived as under. Using star-delta conversion principle, the KDB circuit
- P (S+r3) = Q (R+r2)