

## Elements of Electrical Engineering

- I **D.C. Circuits:-** Effect Of Temperature Upon Resistance, Solutions Of series, parallel in brief, star-delta combination of Resistances, KVL & KCL.
- II **Electrostatics & Capacitance:-** Definitions of Electrostatic, types of capacitors, series, parallel combinations & related circuit calculations in brief charging & discharging of capacitor. Energy stored in capacitor.
- III **Electromagnetics:-** Magnetic Circuit , Comparison Between Electric And Magnetic Circuits , Series/Parallel Magnetic Circuit Calculations , Magnetic Hysteresis, Hysteresis And Eddy Current Loss, Magnetic Materials, Electromagnetic induction, Statically And Dynamically Induced E.M.F.S in brief, Fleming's Right hand rule-Left hand rule, Coefficients Of Self And Mutual Inductances , Coefficient Of Coupling, Series/Parallel Combinations Of Inductances, Rise And Decay Of Current In Inductive Circuits , Force Experienced By Current Carrying Conductor Placed In Magnetic Field.
- IV **Single Phase A.C. Circuits:-** Generation Of Alternating Voltages & Currents, Their Equations, Definitions , R.M.S. And Average Values , Vector Representation Of Alternating Quantities , Addition And Subtraction Of Vectors , Complex Algebra., Phasor Relations Between Voltage And Current In Each Of Resistance, Inductance And Capacitance , A.C. Series And Parallel Circuits , Power And Power Factor , Methods Of Circuit Solution (Analytically & Vectorially), Resonance In Series And Parallel Circuits.
- V **Polyphase Circuits:-** Generation Of Polyphase Voltages , 3,Phase System , Phase Sequence, Inter Connection Of 3 Phases , Voltage, Current And Power Relationships In Balanced Three Phase Circuits , Power Measurement In Single Phase And 3 Phase Circuits.
- VI **Batteries, Cables:-** Battery, life of batteries, charging & discharging of battery. Cables, 2, 21/2, 3 and 4 core armored & unarmored cables.
- VII **Electrical Wiring:-** Connectors & switches, system of wiring, domestic wiring installation, sub circuits in domestic wiring, simple control circuit in domestic installation, industrial electrification.
- VIII **Illumination:-** Types of lamps, fixtures & reflectors, illumination schemes for domestic, industrial & commercial premises, Lumen requirements for different categories.
- IX **Safety & protection:-** Safety, electric shock, first aid for electric shock other hazards of electrical laboratories & safety rules, use of multimeters, grounding, importance of grounding, equipment of grounding for safety. Circuit protection devices, fuses, MCB, ELCB & relays.

### Reference Books:

- I Electrical Technology Vol.1 By B.L.Theraja
- II Basic Electrical Engineering By V.N.Mittal
- III Electrical Estimating & costing by Surjitsingh ( Dhanpat Rai & Co.)