

EA1210: INTRODUCTION TO ELECTRICAL ENGINEERING

UNIT I – D.C. NETWORK THEORY

Review of basic circuit theory concepts, Mesh and Nodal analysis, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Star – delta transformation, Magnetic Circuits.

UNIT II – A.C. CIRCUITS & MEASURING INSTRUMENTS

Single Phase A.C.: Phasor representation of voltage and current, A.C. circuit behavior of resistance, inductance, capacitance & their combination in series and parallel, Power triangle, Power factor, Concept of series & parallel resonance.

Three Phase A.C.: Star – delta connections, Relation between line and phase quantities, three phase power and its measurement, What is 3 phase 4 wire and 3 phase 5 wire system?

Measuring Instruments: Construction and principle of voltage and current measuring instruments.

UNIT III – TRANSFORMERS

Principle of power generation (single line diagram), Principle of operation, Types of construction, Phasor diagram, Equivalent circuit, Efficiency and voltage regulation of single phase transformer, O.C. and S.C. tests.

UNIT IV – D.C. & SYNCHRONOUS MACHINES

D.C. Machines: Construction and working principle of d.c. generator and d.c. motor, Types of d.c. machines, E.M.F. equation, Torque equation, Losses and efficiency, Need of starter in d.c. motors.

Synchronous Machines: Construction and Principle of operation of Alternator and Synchronous Motor.

UNIT V – INDUCTION MOTORS

Three Phase Induction Motors: Principle of operation of 3- ϕ induction motor, Types of 3- ϕ induction motor, Need of starters in 3- ϕ induction motors, Slip – torque characteristics,

Single Phase Induction Motor: Principle of operation of single phase induction motor, Methods of starting of single phase induction motor.

Text Books

1. V. Del Toro. "Principles of electrical Engineering", Prentice hall International.
2. I. J. Nagrath, "Basic Electrical Engineering", Tata Mc Graw Hill.

Reference Books

1. W.H. Hayt & J.E. Kemmerly, "Engineering circuit Analysis", Mc Graw Hill.
2. H. Cotton, "Advanced Electrical Technology" Wheeler Publishing.