16EE102

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNIT – 1 **L-9**

FUNDAMENTALS OF DC CIRCUITS: Circuit concepts, Concepts of network, Active and passive elements, Voltage and current sources, Concept of linearity and linear network, Unilateral and bilateral elements, R, L and C as linear elements, Ohm's Law, Kirchhoff's Laws - Application to simple series, Parallel circuits, Mesh and nodal analysis of simple resistive circuits (Simple numerical problems).

UNIT – 2 **L-9**

FUNDAMENTALS OF A.C. CIRCUITS: Generation of A.C. voltage - Frequency, Average value, R.M.S. value, Form factor, Peak factor for sinusoidal only, Phasor representation of alternating quantities, Analysis of simple series and parallel A.C. circuits (simple numerical problems).

BALANCED THREE PHASE SYSTEMS: Relation between phase and line quantities of voltages and currents in star and delta connected systems (Elementary treatment only).

UNIT – 3 **L-9**

FUNDAMENTALS OF ELECTROMAGNETISM: Concepts of Magneto motive force, Reluctance, Flux and flux density, Concept of self Inductance and mutual Inductance, Coefficient of coupling (only elementary treatment and Simple numerical problems).

TRANSFORMERS: Principle of operation of single phase transformer, Constructional features, EMF
equation (simple numerical problems).

UNIT – 4 **L-9**

DC MACHINES: Constructional details of a D.C. Machine, D.C. Generator, Principle of operation, EMF equation, Types of D.C. generators (simple numerical problems), D.C. Motor, Principle of operation, Torque equation, Types of D.C. motors (simple numerical problems).

A.C MACHINES: Principle of operation of three phase induction motors, Slip ring and squirrel cage motors, Torque equation, Constructional details of synchronous machine.

UNIT – 5 **L-9**

SEMICONDUCTOR DEVICES: Classification of solids based on energy band theory, Intrinsic and Extrinsic semiconductors, P-type and N-type semiconductors, P-N junction diode and its characteristics, Half and Full wave rectifiers, Zener diode and its characteristics, Voltage regulator, Bi polar junction transistor, Operation, Types, Applications.

TEXT BOOKS:

1. V.K.Mehta, “Principles of Electrical Engineering and Electronics”, 3rd edition, S. Chand Publications, New Delhi, 2010.

2. D.P Kothari, “Basic Electrical and Electronics Engineering”, 1st edition., TMH, New Delhi, 2014.

REFERENCE BOOKS:

1. Millman & Halkias, “Integrated Electronics”, McGraw Hill, 1979.

2. A.K. Thereja and B.L. Thereja, “Electrical Technology”, Vol.– II, S Chand Publications, 2007.

3. U.Bakshi & A.Bakshi, “Basic Electrical Engineering”, 1st edition., Technical Publications, Pune, 2005.