II B.Tech I Sem

15AEE10-ELECTRICAL TECHNOLOGY

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UNIT _I: DC Generators

D.C. Generators – Principle of Operation – Action of Commutator – Constructional Features – Armature Windings – Lap and Wave Windings- E. M.F Equation– Numerical Problems - Methods of Excitation – Separately Excited and Self Excited Generators – Build-Up of E.M.F - Critical Field Resistance and Critical Speed - Causes for Failure to Self Excite and Remedial Measures-Load Characteristics of Shunt, Series and Compound Generators.

UNIT _II: DC Motors

D.C Motors – Principle of Operation – Back E.M.F. – Torque Equation – Characteristics and Application of Shunt, Series and Compound Motors- Speed Control of D.C. Motors: Armature Voltage and Field Flux Control Methods- Motor Starters (3 Point and 4 Point Starters)- Losses – Constant & Variable Losses – Calculation of Efficiency – Condition for Maximum Efficiency. Methods of Testing – Direct, Indirect – Brake Test – Swinburne's Test.

UNIT _III: Transformers

Single Phase Transformers-Types - Constructional Details--Emf Equation - Operation on No Load and on Load - Phasor Diagrams - Equivalent Circuit - Losses and Efficiency-Regulation - OC and SC Tests - Sumpner's Test - Predetermination of Efficiency and Regulation-Separation of Losses Test- Auto Transformers-Equivalent Circuit.

UNIT _IV: Induction Motors And Alternators

Induction Motors-Construction Details – Principle of operation - Rotor Power Input, Rotor Copper Loss and Mechanical Power Developed and Their Inter Relation – torque –slip characteristics – simple problems. Principle and operation of alternator - Pitch, Distribution, Winding Factors – E.M.F Equation- Principle and operation of synchronous motors.

UNIT – V Single Phase And Special Motors

Single Phase Induction Motor - Constructional Features – Double Revolving Field Theory- Elementary Idea of Cross Field Theory – Split Phase Motors – Capacitor Start and Run Motors – Shaded Pole Motor. Principle and Performance of A.C Series Motor - Universal Motor – Single Phase Synchronous Motors – Reluctance Motor – Hysteresis Motor – Stepper Motor.

TEXT BOOKS:

1. Electrical Machines – by P.S. Bimbra, Khanna Publishers
2. Principles of Electrical Engineering – By Ashfaq Hussian, Dhanapat Roy & Sons

Vijfa
BOS – chairman