SUBJECT NO-EE21002, SUBJECT NAME- Electrical Machines

LTP- 3-1-0,CRD- 4

SYLLABUS :-

Transformers: Constructional features; Ideal transformer and practical transformer, name plate rating Ã¢ÂÂ phasor diagrams, equivalent circuit and determination of its parameters from O.C and S.C tests; Per unit parameter values and its importance; Regulation, efficiency and all day efficiency Ã¢ÂÂ expressions and calculations. Sumpner Test.3-phase Transformer: As a single unit with name plate rating and as a bank of three single phase transformers; Vector groups for various connections; Per phase analysis; Qualitative explanation for origin of harmonic current and voltage and its suppression Ã¢ÂÂ tertiary winding. Parallel operation Ã¢ÂÂ conditions and load sharing.Autotransformer: Basic constructional features; VA conducted magnetically and electrically. Comparative study with two winding transformer.Three phase Induction machines: Constructional features and types; 3-phase distributed winding production of rotating magnetic field. Concept of slip; Phasor diagram and Development of equivalent circuit and derivation of torque equation, power flow diagram; Typical torque-slip characteristic and influence of different parameters on it; Methods of starting and speed control; Different types of braking Ã¢ÂÂ circuit arrangement and qualitative explanation. No load and blocked rotor tests. Single Phase AC motors:Single Phase induction motor: Double revolving field theory and development of equivalent circuit. Methods of starting using auxiliary winding; selection of capacitor value during starting and running.Universal series motor: constructional features and performance characteristics.D.C Machines: Constructional features, armature windings - simple lap and wave winding; armature voltage and torque equations.D.C generators: Classifications, performance characteristics; Losses, efficiency and power flow diagram.D.C motors: Classifications, torque/speed characteristics of different types; Losses, efficiency and power flow diagram. Starting, speed control and braking. Testing and efficiency. Synchronous machines: Constructional features and types; Operation of synchronous generators and motors connected to bus and phasor diagrams for normal, under and over excited conditions; Power and torque characteristics and capability curves. Parallel operation. Salient pole synchronous machine - phasor diagram and determination of synchronous reactances; starting and speed control of synchronous motors.