4th Semester	REI4D001	Energy Conversion Devices	L-T-P 3-0-0	3 CREDITS

MODULE-I **(12Hrs)**

GENERAL PRINCIPLES OF DC MACHINES: Constructional Features, Methods of Excitation, Expression for EMF Induced and Torque Developed in theArmature.

DC GENERATORS: No Load Characteristics for Separately Excited DC Generator and DC Shunt Generator, Conditions for Self Excitation, Critical Resistance and Critical Speed, Losses andEfficiency.

MODULE-II **(9 Hrs)**

DC MOTORS: Speed~Armature Current, Torque~Armature Current and Speed~Torque Characteristic for (i) Separately Excited DC Motor, (ii) DC Shunt Motor, (iii) DC Series Motor, and (iv) DC Compound Motor, Speed control and Starting of DC shunt and DC series motors, Comparison Between Different types of DC Motors and theirApplication.

MODULE-III **(9 Hrs)**

TRANSFORMERS: Constructional Features, EMF Equation, Turns Ratio, And Determination of Parameters From Tests (Open Circuit Test and Short Circuit Test), Equivalent Circuit, Losses and Efficiency,

MODULE-IV **(9 Hrs)**

Introduction to Three Phase Transformers: Three Single Phase

Transformers Connected as a Bank of Three PhaseTransformer, Introduction to Auto transformer

THREE PHASE SYNCHRONOUS MACHINES: Constructional Features, Principle of operation as Alternator and Synchronous Motor, Starting of SynchronousMotor.

MODULE-V **(9 Hrs)**

THREE PHASE INDUCTION MOTORS: Constructional Features of Squirrel Cage Rotor type and Slip Ring/Wound Rotor type of Induction Motors, Principle of Operation, Concept of Slip, Slip~Torque Characteristics, Starting of Squirrel Cage Rotor type and Slip Ring/Wound Rotor type of Induction Motors, Speed Control of Induction Motors.

Principles of Single phase Induction motors, stepper motor, AC & DC servo motor and their application

Books :

- Theory and Performance of AC Machines – M G Say – CBS Publication
- The Performance and Design of DC Machines – A E Clayton
- ElectricMachines–DPKothari&IJNagrath–TataMcGrawHill.
- Electrical Machinery – P S Bimbhra – Khanna Publishers.
- Electric Machinery – Fitzgerald, Charles Kingsley Jr., S. D. Umans – Tata Mc GrawHill.

- Electric Machinery And Transformers –Guru & Hiziroglu –Oxford UniversityPress.