

## 13EE3109-ELECTROMECHANICAL ENERGY CONVERSION – III

(EEE)

Instruction/week: 4 hrs.

Max. sessional marks:40

Univ. Exam: 3 hrs.

Univ. Exam marks :60

### **UNIT-I**

**Synchronous generators:** Construction-types of alternators-armature windings-emf equation-armature reaction-leakage flux- synchronous reactance-equivalent circuit - phasor diagram-voltage regulation - pre-determination of regulation by synchronous impedance, ampere turn and potier triangle methods- SCR and its importance.

### **UNIT-II**

**Theory of salient pole machines:** Two reaction theory - phasor diagram - determination of  $X_d$  and  $X_q$  from Slip test- Expression for power output of cylindrical and salient pole alternators-power angle characteristics.

### **UNIT-III**

**Parallel operation of alternators:** conditions for parallel operation-synchronization - load sharing - synchronizing power-operation on infinite bus bar-effect of change of excitation - effect of change of mechanical input - excitation systems.

### **UNIT-IV**

**Synchronous motor :** Theory of operation-phasor diagrams-variation of current and power factor with excitation - hunting and its suppression-Determination and predetermination of V and inverted V curves-methods of starting.

### **UNIT-V**

**Single phase induction motors:** Principle of operation – double revolving field theory- cross field theory - equivalent circuit-determination of equivalent parameters.

Starting methods - split phase motors, shaded pole motor - repulsion motor - universal motor and stepper motor.

#### **TEXT BOOKS:**

1. “Theory and performance of Electrical machines” by J.B Gupta, SKKataria publishers.
2. “Electrical Machines” by Ashfaq Hussain , Dhanpatrai & co.

#### **REFERENCES:**

1. “Electrical Machinery” by Dr. P.S Bimbhra, khanna publishers.
2. “Electrical machines” by I.J.Nagarath and D.P.Kothari second edition, Tata McGraw-Hill.