

# AMEE13 ELECTROMECHANICAL ENERGY CONVERSION-II

## UNIT-1 SYNCHRONOUS MACHINE I

- 1.1 Constructional features,.
- 1.2 Armature winding,
- 1.3 EMF Equation, Winding coefficients, equivalent circuit and phasor diagram,
- 1.4 Armature reaction, O. C. & S. C. tests,
- 1.5 Voltage Regulation using Synchronous Impedance Method,
- 1.6 MMF Method, Potier's Triangle Method,
- 1.7 Parallel Operation of synchronous generators,
- 1.8 Operation on infinite bus, synchronizing power and torque co-efficient

## UNIT-2 SYNCHRONOUS MACHINE II

- 2.1 Two Reaction Theory,
- 2.2 Power flow equations of cylindrical and salient pole machines, operating characteristics,
- 2.3 Synchronous Motor: Starting methods,
- 2.4 Effect of varying field current at different loads,
- 2.5 V- Curves, Hunting & damping, synchronous condenser

## UNIT-3 THREE PHASE INDUCTION MACHINE I

- 3.1 Constructional features,
- 3.2 Rotating magnetic field,
- 3.3 Principle of operation Phasor diagram, equivalent circuit, torque and power equations,
- 3.4 Torque- slip characteristics, no load & blocked rotor tests, efficiency,
- 3.5 Induction generator & its applications.

## UNIT-4 THREE PHASE INDUCTION MACHINE II

- 4.1 Starting, Deep bar and double cage rotors, cogging & Crawling,
- 4.2 Speed Control (with and without emf injection in rotor circuit.)

## UNIT-5 SINGLE PHASE INDUCTION MOTOR

- 5.1 Double revolving field theory,
- 5.2 Equivalent circuit,
- 5.3 No load and blocked rotor tests,
- 5.4 Starting methods, repulsion motor
- 5.5 AC Commutator Motors:
- 5.6 Universal motor, single phase a.c. series compensated motor,
- 5.7 Stepper motors

### Reference Books:

1. P. S. Bimbhra, "Electrical Machinery", Khanna Publisher
2. P.S. Bimbhra, " Generalized Theory of Electrical Machines", Khanna Publishers
3. M.G. Say, "Alternating Current Machines", Pitman & Sons