

2/4 B.Tech - THIRD SEMESTER

EC3T5

Electrical Technology

Credits: 3

Lecture: 3 periods/week

Internal assessment: 30 mark

Tutorial: 1 period /week

Semester end examination: 70 marks

Pre-Requisite: Basic knowledge of circuit analysis techniques, Electromagnetic Induction Principle

Course Objectives:

- To understand principle of operation of AC and DC machines
- To study the performance of AC and DC machines
- To Study Different types of instruments for measuring AC and DC quantities

Learning Outcomes:

Student will be able to

- understand the principle of operation of AC and DC machines
- know the testing of AC , DC machines and transformers
- evaluate the measurement of basic electrical quantities

UNIT- I

DC Machines: Construction of a D.C Machine – Principle of operation as a Generator and Motor - EMF equation – Types of generators – Magnetization and load characteristics of DC generators – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Speed control of DC shunt motor – Flux and Armature voltage control methods – Losses and efficiency – Swinburne's Test.

UNIT- II

Transformers: Construction and principle of operation of single phase transformer – Phasor diagram on No Load and Load – Equivalent circuit – Losses and Efficiency of transformer and Regulation – OC and SC tests – Predetermination of efficiency and regulation (Simple Problems).

UNIT- III

Induction Machines: Construction and principle of operation of three-phase induction motors – Slip ring and Squirrel cage motors – Slip-Torque characteristics– Principle of operation of single phase induction motors - Shaded pole motors – Capacitor motors – Stepper Motors – Characteristics

UNIT- IV

Three Phase Alternators: Alternators – Constructional features – Principle of operation – Types - EMF Equation – Distribution and Coil span factors –Determination of Regulation of alternator by synchronous impedance method

UNIT- V

Electrical Instruments: Basic Principles of indicating instruments – Moving Coil, Moving iron Instruments (Ammeters and Voltmeters) - Extension of range of Ammeters & Voltmeters – Dynamometer type Wattmeter & Energymeter.

Learning Resources

Text Books:

1. Fundamentals of Electrical Engineering, Ashfaq Husain
2. Principles of Electrical Engineering, V.K. Mehta and Rohit Mehta, 1st edition, 2012
3. Basic Electrical Engineering , Nagsarkar,Sukhija, Oxford Publications,2nd edition, 2009

References:

1. Basic Electrical Engineering, M.S.Naidu and S.Kamakshiah,TMH Publications, 1st Edition, 2009
2. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI Publications, 2rd Edition, 2009
3. A Text Book of Electrical Technology Vol.II , B.L.Theraja, A.K.Theraja