BE8254 BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING

L T P C 3 0 0 3

UNIT I AC CIRCUITS AND POWER SYSTEMS 9

Three phase power supply – Star connection – Delta connection – Balanced and Unbalanced Loads- Power equation – Star Delta Conversion – Three Phase Power Measurement - Transmission & Distribution of electrical energy – Overhead Vs Underground system – Protection of power system – types of tariff – power factor improvement

UNIT II TRANSFORMER 9

Introduction - Ideal Transformer – Accounting for Finite Permeability and Core Loss – Circuit Model of Transformer – Per Unit System – Determination of Parameters of Circuit Model of Transformer – Voltage Regulation – Name Plate Rating – Efficiency – Three Phase Transformers - Auto Transformers

UNIT III DC MACHINES 9

Introduction – Constructional Features– Motoring and generation principle - Emf And Torque equation – Circuit Model – Methods of Excitation and magnetisation characteristics – Starting and Speed Control – Universal Motor

UNIT IV AC MACHINES 9

Principle of operation of three-phase induction motors – Construction –Types – Equivalent circuit, Single phase Induction motors -Construction– Types–starting and speed control methods. Alternator- working principle–Equation of induced EMF – Voltage regulation, Synchronous motors working principle-starting methods -– Torque equation – Stepper Motors – Brushless DC Motors

UNIT V MEASUREMENT AND INSTRUMENTATION 9

Type of Electrical and electronic instruments – Classification- Types of indicating Instruments –Principles of Electrical Instruments –Multimeters, Oscilloscopes- Static and Dynamic Characteristics of Measurement – Errors in Measurement – Transducers - Classification of Transducers: Resistive, Inductive, Capacitive, Thermoelectric, piezoelectric, photoelectric, Hall effect and Mechanical

TEXT BOOKS:

1. D P Kothari and I.J Nagarath, —Basic Electrical and Electronics Engineering‖, McGraw Hill Education (India) Private Limited, Third Reprint ,2016

2. Giorgio Rizzoni, —Principles and Applications of Electrical Engineering‖, McGraw Hill Education (India) Private Limited, 2010

3. S.K.Bhattacharya —Basic Electrical and Electronics Engineering‖, Pearson India, 2011

REFERENCES:

1. Del Toro, ‖Electrical Engineering Fundamentals‖, Pearson Education, New Delhi, 2015.

2. Leonard S Bobrow, Foundations of Electrical Engineering‖, Oxford University Press, 2013

3. Rajendra Prasad, ‖Fundamentals of Electrical engineering‖, Prentice Hall of India, 2006.

4. Mittle N. Basic Electrical Engineering‖, Tata McGraw Hill Edition, 24th reprint 2016

5. A.E. Fitzgerald, David E Higginbotham and Arvin Grabel, Basic Electrical Engineering‖, McGraw Hill Education (India) Private Limited, 2009