[Electrical Engineering Material Sp Seth Pdf Free Download]

Course Title	Basic Electrical and Electronics Engineering
Course number	EE-111
Credit Value	4
Course Category	ESA
Pre-requisite	Nil
Contact Hours (L-T-P)	3-1-0
Type of Course	Theory

Course Objectives

The objective of this course is to set a firm and solid foundation in Electrical & Electronics Engineering with strong analytical skills and conceptual understanding of theorems and analysis methods in electrical and magnetic circuits, electronic devices, circuits, measuring instruments. The course will familiarize students with various motors, transformers, power generation system.

Course Outcomes

After successful completion of this course, the students will be able to:

1. Analyse electrical and magnetic circuits with moderate complexity applying fundamental laws and theorems in steady-state as well as transient operation.
2. Analyse AC circuits using phasors.
3. Converse with transformers, motors, measuring instruments.
4. Understand various methods of electrical generation
5. Identify schematic symbols and understand the working principles of electronic devices e.g. Diode, Zener Diode, LED, BJT, JFET and MOSFET etc.
6. Understand the working principles of electronic circuits e.g. Rectifiers, Amplifiers and Operational Amplifiers etc.
7. understand methods to analyse and characterize these circuits

Syllabus

PART A

UNIT I: Circuit and Transformers

Review of dc circuits and theorems, 1-phase circuits, superposition theorem, thevenin's theorem and norton's theorem for ac circuits, RLC series and parallel circuits, 3-phase balanced ac circuits. Magnetic circuits, magnetization curve, hysteresis & eddy current effect/losses. Transformer construction, equivalent circuit, calculation of losses and efficiency.

UNIT II: Introduction to Electrical Machines, Instruments and Power System

3-phase induction motor and 1-phase induction motors. Basic elements of an instrument: MC, MI instruments, dynamometer wattmeter, digital energy meter. Elements of power system, layout of thermal, hydro, nuclear and gas plants. Introduction to renewable energy sources and recent trends in generation.

PART B

UNIT III: Diode and BJT

Terminal characteristics of diodes, diodes models; Ideal, constant voltage and piecewise linear, load line concept, Diode applications; Rectifier, logic gates, Zener diode; Operation, characteristics, voltage regulation. Bipolar Junction Transistor; Construction, operation, configurations, characteristics of common emitter configuration, DC load analysis.

UNIT IV: MOSFET and OPAMP

Introduction to MOSFET; Depletion MOSFET construction, operation, Enhancement MOSFET construction, Operation, amplifiers, Operational Amplifiers; equivalent circuit, ideal behavior, open loop and closed loop concept, concept of virtual short, simple Opamp applications; Unity gain amplifier, inverting, non-inverting, integrator, differentiator, subtractor, summer.

Books/ References

1. Ashfaq Husain*: Fundamentals of Electrical Engineering, 3rd Edition, Dhanpat Rai & Sons.
2. R. Boylestad & L. Nashelsky*: Electronic Devices and Circuits, Prentice Hall, 1995.

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