ELEMENTS OF ELECTRICAL ENGINEERING

Course Code - Category: CSE124 - ES

Credits:3

L	T	P	E	O
3	0	0	1	4

Sessional Marks:40

End Exam: 3 Hours

End Exam Marks:60

Prerequisites:

Course Objectives:
- Analysis of circuits by using KCL and KVL
- Finding equivalent circuits by using circuit theorems
- Analysis of magnetic circuits
- Principle of operation and behavior of electrical machines

Course Outcomes:

By the end of the course, the student will be able to:	
1.	Calculate voltage a cross, current through and power supplied / absorbed by an electrical element.
2.	Obtain the performance characteristics of D.C. Machines.
3.	Obtain the voltage regulation characteristics of a Transformer.
4.	Obtain the performance characteristics of Induction Motor.

SYLLABUS

UNIT I

Electric Circuits : Circuit Elements, Basic Law's, KVL, KCL, Linearity Principle (Super Position), Mesh and Nodal analysis, Thevenin's and Norton's theorems.

UNIT II

Magnetic Circuits : Definitions of magnetic circuit, Reluctance, Magneto-motive force, magnetic flux, Simple problems on magnetic circuits. Faraday's laws of Electromagnetic Induction, Induced E.M.F., Dynamically induced E.M.F.

UNIT III

D.C. Generators : D.C. Generator principle, construction of D.C. generator, E.M.F equation of D.C. generator, Types of D.C. generators, Efficiency, Applications.

UNIT IV

D.C. Motors : principle, working of D.C. Motors, significance of back E.M.F., Torque equation of D.C. Motors, Types of D.C. Motors, Special Motors (Stepper Motor and Servo Motor) and Applications.

UNIT V

AC Machines : Transformer working Principle, EMF equation of transformer, Voltage regulation of

Transformer. Three-phase Induction Motor working principle, Construction of 3 Phase Induction Motor, Principle of operation, Types of 3 phase induction Motors, Applications.

TEXT BOOKS:
1. **V.K. MEHTA &ROHIT MEHTA** *"Principles of Electrical Engineering"* 2nd edition, S. Chand Publications.
2. **V.K. MEHTA & ROHIT MEHTA** *"Principles of Electrical Machines"* 2nd edition, S. Chand Publications.

REFERENCE BOOK:
1. **J.B. Gupta** *"A Text book of Electrical Engineering"* S.K. Kataria& Sons Publications.