

Course Name : Electrical Engineering Group
Course Code : EE/EP
Semester : Fourth
Subject Title : D.C. Machines & Transformers
Subject Code : 9061

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	02	03	80	20	50#	--	25@	175

Rationale:

This subject is classified under core technology group which intends to teach facts, concepts, principles & procedure for operation & testing of electrical machines, such as DC generators, DC motors and single & three phase transformers. Student will be able to analyze the characteristics of DC motors, Transformers & Qualitative Parameters of these machines.

These machines are used in transmission, distribution & utilization systems. Knowledge gained by the students will be helpful in the study of technological subjects such as utilization of electrical energy, switch gear & protection, manufacturing processes & testing & maintenance of electrical machines.

The knowledge & the skills obtained will be helpful in discharging duties such as supervisor, controller & R & D technician.

Objectives:

Student will be able to

1. Know the constructional details & working principles of dc machines & transformers.
2. Test motors & transformers.
3. Evaluate the performance of dc motors & transformers by conducting various tests.
4. Decide the suitability of dc generator motor & transformer for particular purpose.
5. Write the specifications of dc machines & transformers as per requirement.
6. Operate any machine properly.

Learning Structure:

Application

Applications in generation, Transmission, Distribution, Utilization & Protection of Power system For learning higher semester subjects such as AC machines, switchgear & drives

Procedures

Testing of transformer
Principle of Electromagnetism & supply system

Performance & testing of DC motors

Construction & operation of transformers

Construction & operation of DC motor

Principle

Types of Transformer

Construction & operation of DC generator

Types DC Motor & Generator

Concepts

Working principle of Transformer

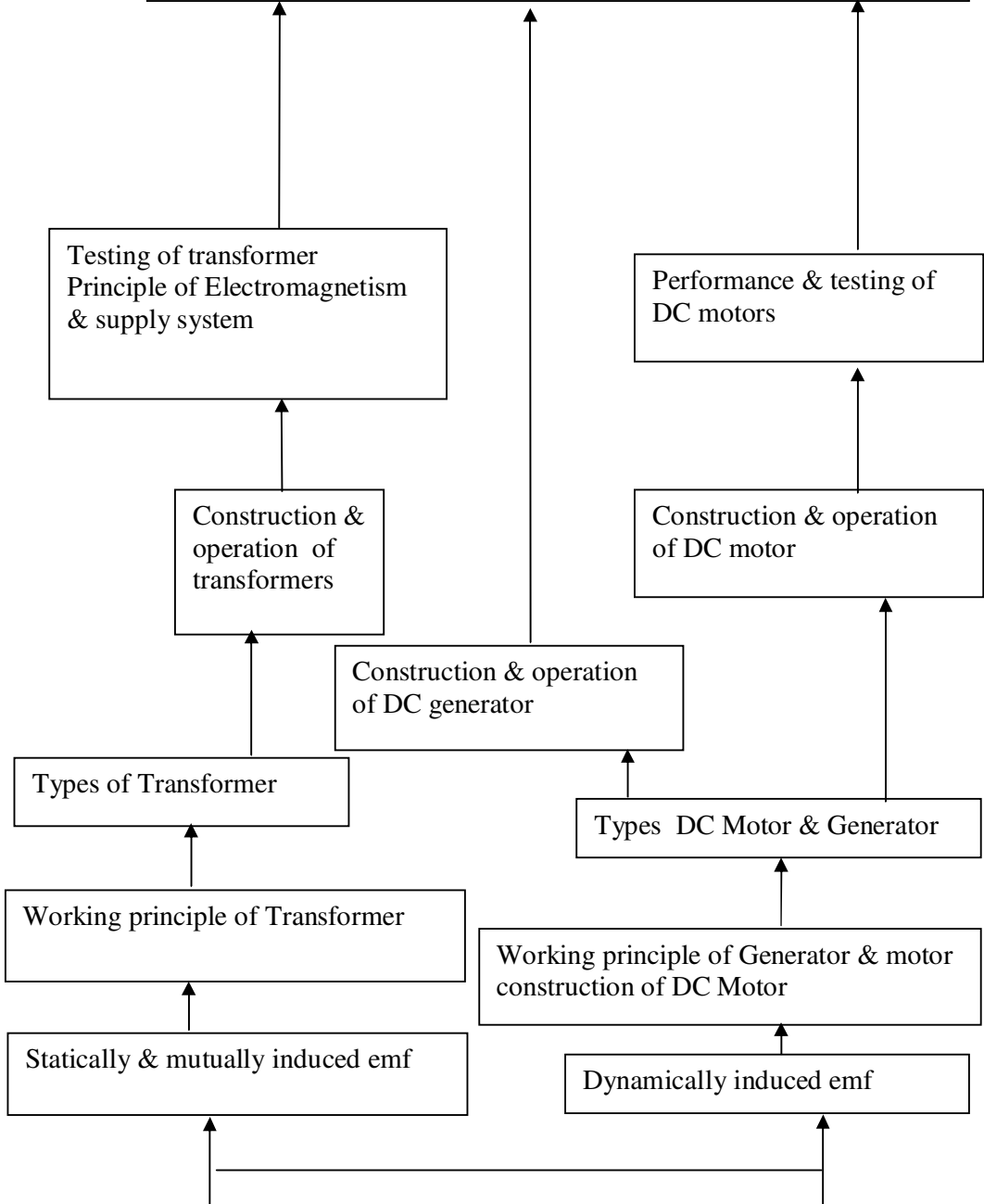
Working principle of Generator & motor construction of DC Motor

Statically & mutually induced emf

Dynamically induced emf

Facts

Various parameters of electrical network .Laws of electromagnetic induction, Lenz law, Concept of L, C, R & power factor.



Chapter	Contents	Hours	Marks
	5.2 potential transformer		
	5.3 isolation transformer		
	5.4 welding transformer		
Total		48	80

Practical:

Skills to be developed:

Intellectual Skills:

1. Analytical Skills.
2. Identification skills.

Motor Skills:

1. Measurement Skills.
2. Connection Skills.

List of Practicals:

- 1) a) To identify the constructional parts of D. C. machine.
b) To plot the O.C.C. of a given d. c. machine and to find critical resistance.
- 2) To find the performance of d. c. series & shunt motor by conducting load test
- 3) a) To control the speed of d. c. shunt motor above and below normal speed.
b) To reverse the direction of rotation of d. c. motor.
- 4) a) To identify the constructional details of 1-phase and 3-phase transformer.
b) Visit to maintenance and repair workshop of a transformer and prepare a report.
- 5) To measure the performance of single phase transformer by direct loading and to find transformation ratio.
- 6) To measure the performance of single phase transformer by conducting O.C. and S.C. test.
- 7) To identify terminal polarity of corresponding phases of 3-phase transformer & to calculate transformation ratio.
- 8) To compare 1-phase auto transformer with two winding transformer by collecting literature from local dealer/manufacturer & compare the data on following points.
Weight of iron, weight of copper, turns ratio, efficiency & percentage regulation.
- 9) To observe the phase difference between primary & secondary voltage of 3-phase transformer for various vector groups.

Learning Resources:**Books:**

Sr.No	Title	Author	Publisher & Address
1	Electrical Technology	E. Hughes	Logmans, London
2	Electrical Technology	H. Cotton	C. B. S. Publisher New Delhi
3.	Electrical Technology Vol. II	B. L. Theraja	S. Chand & CO Delhi
4.	Electrical Machine Design	A. K. Sohawney	Dhanpatrai & Sons, New Delhi