

21PCM105T					Elements of Electrical Engineering					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25	--	--	100

COURSE OBJECTIVES

- Learn the basic principles of electrical laws and analysis of networks
- Understand the principle of operation and construction details of dc machines
- Understand the principle of operation and construction details of transformer
- Understand the principle of operation and construction details of alternator and 3-phase induction motor
- Study the operation of PN junction diode, half wave, full wave rectifiers and op-amps
- Learn the operation of PNP and NPN transistors and various amplifiers

UNIT I ELECTRICAL CIRCUITS

7 Hrs.

Basic definitions - types of network elements - Ohm's Law - Kirchhoff's Laws - inductive networks - capacitive networks - series - parallel circuits - star-delta and delta-star transformations.

UNIT II DC AND AC ROTATING MACHINES

7 Hrs.

Principle of operation of DC generator - EMF equation - types of DC machines - torque equation - applications - three point starter - speed control methods of DC motor - Swinburne's test. Principle of operation and construction of alternators - types of alternators - principle of operation of synchronous motor - principle of operation of 3-Phase induction motor - slip-torque characteristics - efficiency - applications.

UNIT III TRANSFORMERS

7 Hrs.

Principle of operation and construction of single phase transformers - EMF equation - Losses - OC & SC tests - efficiency and regulation.

UNIT IV RECTIFIERS, LINEAR ICs AND TRANSISTORS

7 Hrs.

PN junction diodes - diode applications (half wave and bridge rectifiers). Characteristics of operation amplifiers (OP-AMP) - application of OP-AMPs (inverting, non-inverting, integrator and differentiator). PNP and NPN junction transistor, transistor as an amplifier - transistor amplifier - frequency response of CE amplifier - concepts of feedback amplifier.

Max. 28 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1: Analyse the various electrical networks

CO2: Understand the operation of dc generators, 3-point starter and conduct the Swinburne's test

CO3: Analyse the performance of transformer

CO4: Explain the operation of 3-phase alternator and 3-phase induction motors

CO5: Analyse the operation of half wave, full wave rectifiers and op-amps.

CO6: Explain the single stage CE amplifier and concept of feedback amplifier

TEXT/REFERENCE BOOKS

1. Electrical Technology, Surinder Pal Bali, Pearson Publications.
2. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9 edition, PEI/PHI 2006.
3. Electrical Circuit Theory and Technology, John Bird, Routledge Taylor & Francis Group.
4. Basic Electrical Engineering, M.S.Naidu and S.Kamakshiah, TMH Publications.
5. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI Publications, 2 edition.
6. Basic Electrical Engineering, Nagsarkar, Sukhija, Oxford Publications, 2 edition.
7. Industrial Electronics, G.K. Mittal, PHI.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Part A: 3 Questions from each unit, each carrying 3 marks

Part B: 2 Questions from each unit, each carrying 8 marks

Exam Duration: 3 Hrs.

36 Marks

64 Marks