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DEPARTMENT OF ELECTRICAL ENGINEERING

Govt. Polytechnic, Balasore

LESSON PLAN FOR ACADEMIC SESSION - 2024-2025
CIRCUIT AND NETWORK THEORY

Course Code : Th-2	**Semester : 3RD**
Total Periods : 75(60L+15T)	**Examination : 3 Hours**
Theory Periods : 4 P/Week	**Internal Assessment : 20 Marks**
Tutorial : 1 P/Week	**End Semester Examination : 80 Marks**
Maximum Marks : 100	
Semester From Date : 01/07/2024	**To Date : 16/12/2024**
Name of Teaching Faculty : Er. CHANDRA PRAKASH LENKA	

WEEK	PERIOD	TOPIC
1st	1st	**MAGNETIC CIRCUITS** Introduction to Magnetic Circuits
	2nd	Magnetizing force, Intensity, MMF, flux and their relations
	3rd	Permeability, reluctance and permeance
	4th	Analogy between electric and Magnetic Circuits
	5th	Tutorial (**Doubt clearing and revision class)**
2nd	1st	B-H Curve.
	2nd	Series & parallel magnetic circuit
	3rd	Hysteresis loop & Problems related to above topics
	4th	**COUPLED CIRCUITS:** Self Inductance and Mutual Inductance
	5th	Tutorial (**Doubt clearing and revision class)**
3rd	1st	Conductively coupled circuit and mutual impedance
	2nd	Dot convention & Coefficient of coupling
	3rd	Series and parallel connection of coupled inductors
	4th	Numerical problems
	5th	Tutorial (**Doubt clearing and revision class)**
4th	1st	**CIRCUIT ELEMENTS AND ANALYSIS:** Active, Passive, Unilateral & bilateral, Linear & Non linear elements & Mesh Analysis,
	2nd	Mesh Equations by inspection Super mesh Analysis

	3rd	Nodal Analysis, Nodal Equations by inspection
	4th	Super node Analysis & Related Problems
	5th	Tutorial (**Doubt clearing and revision class)**
5th	1st	Source Transformation Technique
	2nd	Numerical problems (With Independent Sources Only)
	3rd	**NETWORK THEOREMS:** Star to delta and delta to star transformation
	4th	Super position Theorem
	5th	Tutorial (**Doubt clearing and revision class)**
6th	1st	Thevenin's Theorem
	2nd	Numerical problems (With Independent Sources Only)
	3rd	Norton's Theorem.
	4th	Maximum power Transfer Theorem
	5th	Tutorial (**Doubt clearing and revision class)**
7th	1st	Numerical problems (With Independent Sources Only)
	2nd	Numerical problems (With Independent Sources Only)
	3rd	**AC CIRCUIT AND RESONANCE:** A.C. through R-L, R-C & R-L-C Circuit
	4th	Solution of problems of A.C. through R-L, R-C & R-L-C series Circuit by complex algebra method
	5th	Tutorial (**Doubt clearing, Numericals and revision class)**
8th	1st	Solution of problems of A.C. through R-L, R-C & R-L-C parallel & Composite Circuits.
	2nd	Power factor & power triangle. Deduce expression for active, reactive, apparent power
	3rd	Derive the resonant frequency of series resonance circuit
	4th	Derive the resonant frequency of parallel resonance circuit
	5th	Tutorial (**Doubt clearing, Numericals and revision class)**
9th	1st	Define Bandwidth, Selectivity & Q-factor in series circuit
	2nd	Numerical problems
	3rd	**POLYPHASE CIRCUIT** Concept of poly-phase system and phase sequence
	4th	Relation between phase and line quantities in star & delta connection
	5th	Tutorial (**Doubt clearing and revision class)**
10th	1st	Power equation in 3-phase balanced circuit
	2nd	Numerical problems
	3rd	Measurement of 3-phase power by two wattmeter method.
	4th	Numerical problems
	5th	Tutorial (**Doubt clearing and revision class)**
11th	1st	**TRANSIENTS:** Steady state & transient state response
	2nd	Response to R-L circuit under DC condition
	3rd	Response to R-C circuit under DC condition
	4th	Response to RLC circuit under DC condition
	5th	Tutorial (**Doubt clearing and revision class)**
12th	1st	Numerical problems
	2nd	Numerical problems
	3rd	**TWO-PORT NETWORK:** Open circuit impedance (z) parameters

	4th	Short circuit admittance (y) parameters
	5th	Tutorial (**Doubt clearing and revision class)**
13th	1st	Transmission (ABCD) parameters
	2nd	Hybrid (h) parameters
	3rd	Inter relationships of different parameters
	4th	Inter relationships of different parameters
	5th	Tutorial (**Doubt clearing and revision class)**
14th	1st	T and π representation.
	2nd	Numerical problems
	3rd	**FILTERS:** Define filter Classification of pass Band, stop Band and cut-off frequency
	4th	Constant – K low pass filter
	5th	Tutorial (**Doubt clearing and revision class)**
15th	1st	Constant – K high pass filter
	2nd	Constant – K Band pass filter
	3rd	Constant – K Band elimination filter.
	4th	Numerical problems
	5th	Tutorial (**Doubt clearing and revision class)**