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DEPARTMENT OF ELECTRICAL ENGINEERING

Govt. Polytechnic, Balasore

LESSON PLAN FOR ACADEMIC SESSION - 2024-25
CIRCUIT THEORY

Course Code : Th.2	**Semester : 3RD**
Total Periods : 60 Periods	**Examination : 3 Hours**
Theory Periods : 4 P/Week	**Internal Assessment : 20 Marks**
Tutorial : -	**End Semester Examination : 80 Marks**
Maximum Marks : 100	
Semester From Date : 01/07/2024	**To Date : 16/12/2024**
Name of Teaching Faculty : Sri Biswajit Mallik (Sr. Lect. Electrical)	

WEEK	PERIOD	TOPIC
1st	1st	Define Network elements
	2nd	Explain scope of network analysis & synthesize
	3rd	Define Electric charge, electric current, Electrical energy, Electrical potential, R-L-C parameters, Energy Sourc
	4th	Define Active& Passive Elements, Explain current and voltage source, their transformation
2nd	1st	Current and voltage source, their transformation & mutual inductance
	2nd	Explain Star – Delta transformation,
	3rd	Mesh analysis with simple problem.
	4th	Nodal analysis with simple problem
3rd	1st	State, Explain & Prove Millman Theorem and their applications.
	2nd	State, Explain & Prove Thevenin's Theorem and their applications.
	3rd	State, Explain & Prove Norton's Theorem and their applications.
	4th	State, Explain & Prove Maximum Power transfer Theorem and their applications.
4th	1st	State, Explain & Prove Reciprocity Theorem and their applications.
	2nd	State, Explain & Prove Superposition Theorem and their applications.
	3rd	Solve numerical problems of above.
	4th	Define frequency, Cycle, Time period, Amplitude, Average value, RMS value & Form factor of AC Wave
5th	1st	Define phasor representation of alternating quantities

	2nd	Explain the behaviour of A.C. through pure resistor
	3rd	Explain the behaviour of A.C. through pure inductor and capacitor.
	4th	Explain the behaviour of R-L, R-C, R-L-C series circuit
6th	1st	Draw the phasor diagram and voltage triangle
	2nd	Solve numerical problems of above Circuit.
	3rd	Explain the behaviour of R-L, R-C parallel circuit
	4th	Explain the behaviour of R-L-C parallel circuit
7th	1st	Solve numerical problems
	2nd	State & Explain Series resonance
	3rd	Derive the following expression for series resonance a. Condition for Resonance
	4th	b. Frequency of Resonance
8th	1st	c. Impedance, Current, Voltage, Q Factor and Power Factor of Resonance
	2nd	d. Bandwidth interm of Q.
	3rd	State Explain Parallel Resonance (RL,RC& RLC)
	4th	Derive the expression for Parallel Resonance
9th	1st	What are the comparisons of Series & Parallel resonance
	2nd	Define Network equations & initial conditions for resistor, inductor & capacitor
	3rd	Analysis and derive the equation for circuit parameters of R-L circuit to DC
	4th	Analysis and derive the equation for circuit parameters of R-C circuit to DC
10th	1st	Analysis and derive the equation for circuit parameters of R-L-C circuit to DC
	2nd	Define Time Constant of the above Circuit
	3rd	Tutorial
	4th	Define Laplace Transformation
11th	1st	Analysis and derive the equations for circuit parameters of Step response of R-L, R-C.
	2nd	Analysis and derive the equations for circuit parameters of Step response of R-L-C.
	3rd	Analysis and derive the equations for circuit parameters of Impulse response of R-L, R-C.
	4th	Analysis and derive the equations for circuit parameters of Impulse response of R-L-C.
12th	1st	Define Network functions for one port & two port networks.
	2nd	Define & Explain Open circuit (Z-Parameter)parameter.
	3rd	Define & Explain Short Circuit(Y-Parameter) Parameter.
	4th	Calculate open & short Circuit Parameters for Simple Circuits
13th	1st	Define & Explain h- parameter (hybrid parameter)
	2nd	Define T-Network & PI – Network
	3rd	Tutorial.
	4th	Define filters, cut off frequency, pass band and stop band.
14th	1st	Classify filters; low pass, high pass, band pass, band stop filters & study their Characteristics.
	2nd	Define Attenuation and Gain, Bel and Decibel & neper and their relations
	3rd	Define Attenuators

	4th	Define T- Type & PI – Type attenuators
15th	1st	Tutorial.
	2nd	Tutorial.
	3rd	Tutorial.
	4th	Tutorial.