II B.Tech - I Semester
(20EC3003) NETWORK ANALYSIS

Int. Marks Ext. Marks Total Marks

			L	**T**	**P**	**C**
30	**70**	**100**	**3**	**-**	**-**	**3**

Pre-Requisites: Physics

Course Objectives:
- Summarize the properties of electrical elements and networks
- Compute network variables with the help of various analytical methods
- Evaluate the frequency response of electric networks
- Select appropriate network theorems to analyze electric circuits.

UNIT–I:
Introduction to Electrical Circuits: Basic electrical components and sources, Network reduction techniques, Sourcetransformation, Nodal analysis, and Mesh analysis, Principle of duality

UNIT–II:
Sinusoidal analysis on A.C Systems: AC fundamentals, Concept of phasor and powers, Steady-state analysis of AC circuits R, RLand RLC circuits

UNIT-III: Coupled Circuits and Resonance: Self and Mutual inductance, analysis of coupled circuits, Dot rule, conductively coupledequivalent circuits. Series and Parallel resonance.

Unit – IV: Network Theorems and Two port network
Superposition, Thevenin's, Norton's, Milliman's, Reciprocity, Max Power Transfer, Substitution, - problem solving using dependent sources also
Two port network parameters – Z, Y, ABCD, Hybrid parameters and their relations.

Unit – V: Transients
Transient response of R-L, R-C, R-L-C circuits for DC, Pulse and AC excitations, Solution using classical methods only

Course Outcomes:
After successful completion of the course, the students can be able to:

S.No	Course Outcome	BTL
1	Study the concepts of passive elements, types of sources and various network reduction techniques	L2
2	Understand the behaviour of RLC networks for sinusoidal excitations	L1
3	Understand the applications of network theorems for analysis of electrical networks	L1
4	Study the concept of magnetic coupled circuits	L2
5	Find the transient response of electrical networks for different types of excitations	L2

Correlation of COs with POs& PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	PO11	P012	PSO1	PSO2
CO1	3	3	-	-	-	-	-	-	-	-	-	-	2	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	3	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	3	-
CO4	3	3	-	-	-	-	-	-	-	-	-	-	3	-

Text Books:
1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley, McGraw HillCompany, 6th edition
2. Fundamentals of Electrical Circuits by Charles K. Alexander and MathewN.O. Sadiku, McGraw Hill Education (India)

Reference Books:
1. Network Analysis: Van Valkenburg; Prentice-Hall of India Private Ltd.
2. Fundamentals of Electrical Circuits by   Charles K. Alexander and Mathew N.O. Sadiku, McGraw Hill Education (India)
3. Electrical Circuit Analysis-2 by A Sudhakar, Shyammohan S Palli, McGraw HillEducation (India)
4. Circuit Theory (Analysis and Synthesis) by A.Chakrabarthi, DhanpatRai&Co.
5. Electric Circuits by David A. Bell, Oxford publications
6. Electric Circuits– (Schaum's outlines) by Mahmood Nahvi& Joseph Edminister, Adapted by K. Uma Rao, 5th Edition – McGraw Hill