LNCT University
Diploma EX, III Semester Syllabus

NETWORK ANALYSIS (DEX-301)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO-1	Use network techniques, like node analysis and loop analysis, to write equations for large linear circuits.
CO-2	Apply Network Topology and consents of graphs theory in networks.
CO-3	Apply the concept of coupling and dot convention in mutually coupled circuits.
CO-4	Use various network theorems for finding current, voltage and power in circuits.
CO-5	Know the basic concepts of network parameters and their measurement.

COURSE CONTENTS

UNIT I: CIRCUIT ELEMENTS
Dependent & independent sources, Active and passive elements, Unilateral and bilateral elements, linear and Non Linear elements, Number of loops, nodes, branches of a network. Analysis of networks by "Mesh" and "Nodal" methods. Concept of charge, current, voltage, EMF, resistance, resistivity, Ohm's law, KCL, KVL.

UNIT II: GRAPH THEORY
Network topology, Concept of Network graph, Tree, Tree branch & link, Incidence matrix, cut set and tie set matrices, number of possible trees of a given graph.

UNIT III: CIRCUIT CONFIGURATIONS
Series and parallel combination of resistances star to delta and delta to star transformation. Related numerical problems. Self and mutual inductance - Coefficient of coupling. Series and parallel resonance.

UNIT IV: NETWORK THEOREMS
Superposition Theorem, Thevenin's Theorem, Norton's' Theorem, Millmann's Theorem and Maximum Power Transfer Theorems with numerical problems for dependent and independent sources.

UNIT V: TWO PORT PARAMETERS
Open Circuit Impedance parameters (Z-Parameters), Short Circuit Admittance parameters (Y-Parameters), Transmission parameters (ABCD-Parameters), Hybrid parameters (h-Parameters), their inverse relationship between parameters, Interconnection of two ports networks.

Reference Books: -

1. Network Analysis with Applications, William D Stanley.
2. Circuit theory, Chakraborty.
3. Network Analysis, Mittal.

List of suggestive core experiments: -

1. To verify KCL and KVL.
2. To verify Thevenin's theorem.
3. To verify Superposition theorem.
4. To Verify maximum power transfer theorem.
5. To find two port network parameters – Z parameters.
6. To find two port network parameters – Y parameters.
7. To find two port network parameters – H parameters.
8. Verification of Reciprocity Theorem for DC circuits.
9. Verification of Millmann's Theorem for DC circuits.
10. To study R-L-C series circuit.
11. To study R-L-C parallel circuit.