

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B.E. SECOND YEAR

ELECTRONICS & COMMUNICATION

(In Force June 2006)

SEMESTER - III

EC 303: NETWORK THEORY

Teaching Scheme		Examination Scheme				
Theory Hrs.	Practical Hrs.	Theory Hrs.	Theory Marks	Pract./ Viva Marks	Term Work Marks	Total Marks
4	2	3	100	25	25	150

SYLLABUS

NETWORK EQUATION FORMULATION:

Reference direction for current and voltage, Active and passive element, dot conversion for couple ckt., Topological description of networks, Kirchoff laws, No. of Network eqn. source transformations, Examples of the formulation of network equations, Loop variable analysis, Node variable analysis, Determinates, Minors and gauss's method, Duality, State variable analysis.

NETWORK EQUATIONS SOLUTIONS:

Classical method, General and particular solution, time constant, Integrating factor, More complicated network, Second order eqns. With internal and external excitation, initial conditions in networks, Higher order eqns., Network excited by external energy source, Response as related to S-Plane location of roots, General solutions in terms of S, Q and Wn, Laplace transformation, Initial and final values of network variables.

TRANSFORMS OF SPECIAL SIGNAL WAVEFORMS:

Shifted unit step function, Ramp and Impulse function, Waveform synthesis.

IMPEDENCE FUNCTIONS AND NETWORK THEORMS:

Concept of complex freq., Transfer impedance and transform ckts. Super position, Reciprocity, Thevenin's and Norton's Theorems.

NETWORK FUNCTIONS:

Network functions for 1 port and 2 port, Ladder network, poles and zeros of network functions, time domain behavior from pole and zero plots.

TWO PORT PARAMETERS:

Relationship of two port variables, Admittance, impedance, transmission and hybrid parameters, relationship between parameter sets, Parallel connection of two port networks.

INPUT POWER AND POWER TRANSFER:

Sinusoidal steady state analysis, Energy and power, Effective or RMS value, average and complex power, maximum power transfer theorem, impedance matching.

Note: Laboratory work should include MATLAB based Practicals & Analysis

REFERENCE BOOKS:

1. Network Analysis by M.E.Van Vulkenberg
2. Engineering Circuit Analysis by William Hayt, J.Kemberly & Durbin (TMH)
3. Linear Circuit Analysis by De Carlo & Lin (Oxford Press)
4. Getting Started with MATLAB by Rudra Pratap Singh (Oxford Press)
5. Electric Circuits by J.Edminister, Schaum Series, McGraw Hill
6. Network Analysis & Synthesis by U.A.Patel (Mahajan)