EE-302: Network Synthesis

Credit	L	T	P
3	2	1	-

UNIT-I

Network graph, properties of tree in a graph, incidence matrix, cut- set matrix, tie- set matrix and their properties, No. of possible trees of graph, Maximum power transfer theorem, Tellegen's theorem, Millman's theorem, Reciprocity theorem, duality.

UNIT-II

Transfer function, transient and steady state system, transient response, natural response, zero state response, initial condition, complete response: inductance, capacitance, RL, RC and RLC network their Continuity relationship, their response to sinusoidal input, to exponential excitation, second order response.

UNIT-III

Two port networks, synthesis, impedance parameters, admittance parameters, transmission parameters, inverse transmission parameters, hybrid parameters, inverse hybrid parameters, their reciprocity and symmetry conditions, inter- relationship between the parameters, inter-connection of two port networks, cascaded connection, series, parallel, series –parallel connection.

UNIT-IV

Network functions, driving point impedance function, voltage transfer function, ladder network, poles- zeros, necessary condition for transfer function, necessary conditions for driving function, effect of pole position on stability, significance of pole zero position, time-domain and frequency response from pole- zero plot.

UNIT-V

Driving point immitance function: properties, physical realizability, Synthesis: Hurwitz polynomial and properties, positive real function and properties, LC, RC, RL- network and their synthesis using Foster –I, II and Cauer –I, II form.

TEXT/REFERENCE BOOKS.

1. A. Sudhakar, Shyammohan S. Palli, "Circuits & Networks – Analysis and Synthesis", Tata Mc Graw Hill Co.,3rd Edition,New Delhi.
2. Network Analysis by Mac Van Valkenberg
3. Network analysis and synthesis by F. F. Kuo
4. Network analysis and synthesis by C. L. Wadhwa
5. Fundamentals of Network analysis and synthesis by Behrouz Peikari