

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Electronics & Communication Engineering

Semester: 3

Subject Code

Subject Name ELECTRONIC NETWORKS AND LINES

Sr. No.	Course content
1.	NETWORK THEOREMS : 1.1 Kirchoff's Voltage and current Laws 1.2 Mesh and nodal analysis 1.3 Principle of Duality. 1.4 Driving point, Transfer impedance and image impedance. 1.5 Super position theorem 1.6 Thevenin's Theorem 1.7 Reciprocity Theorem. 1.8 Notron's Theorem. 1.9 Maximum Power Transfer Theorem. 1.10 Network Transformation T to Pai and Pai to T
2.	RESONANCE AND COUPLED CIRCUIT : 2.1 Definition of Q(Quality Factor) 2.2 Series resonance 2.3 Parallel resonance 2.4 Bandwidth and selectivity of series and parallel resonance. 2.5 Mutual inductance. 2.6 Co-efficient of coupling. 2.7 Ironcore transformer. 2.8 Single Tuned air-core transformer without derivation. 2.9 Doubled air-core transformer without derivation.
3.	ATTENUATOR AND EQUILISER : 3.1 Characteristic Impedance of T and Pai Network. 3.2 Attenuation in Nepers and Decibels and relation between Nepers and Decibels. 3.3 Symmetrical T and Pai attenuator. 3.4 Lattice Attenuator & Bridge T. 3.5 Amplitude equalizer(Series and Shunt). 3.6 Phase Equalizer.
4.	FILTERS : 4.1 Difference between Active filter and Passive filter . 4.2 Passive filters : Low pass, High pass & band pass filter. 4.3 Active filters : Low pass, High Pass & band pass using OP Amp.
5.	TRANSMISSION LINE-THEORY : 5.1 Transmission line general equation. 5.2 Infinite line. 5.3 Wave length, velocity of propagation.

	5.4	Wave form distortion.
	5.5	The Distortionless line.
	5.6	Loading of Telephone cable.
	5.7	Standing wave ratio and reflection coefficient

LABORATORY EXPERIENCES:

The sample experiments to be performed include, but are not limited to the following.

1. To verify kirchoff's current law and voltage law .
2. To verify the thevenin's theorem.
3. To verify superposition theorem.
4. To verify T to Pai conversion.
5. To obtain frequency response of series resonance circuit and to determine bandwidth and Q.
6. To obtain frequency response of parallel resonance circui and to determine bandwidth and Q.
7. To obtain frequency response constant K-Lowpass filter.
8. To obtain frequency response of constant K-Highpass filter.
9. To obtain frequency response of M-derived Low pass filter.
10. To verify maximum power transfer theorem.
11. To design and test T-type attenuator.
12. To design and test Pai-type attenuator.
13. To design and test amplitude equalizer.

Reference Books:

1. Network Lines and Field - J.D. Ryder
2. Network Analysis - G.K. Mithal
3. Network theory and filter design Vasudev K.Arre
4. Transmission Lines filter of Network. - V. Vijay
5. Handbook of line communication - Royal Signal
6. Electronic devices and circuit theory - Robert Boysted & Louis Nashelsky - Pearson
7. Networks and Transmission Lines – Kumar - Pearson