

VEER SURNDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA, ODISHA



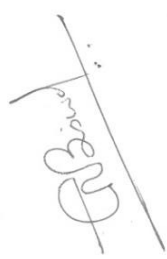
LESSON PLAN



Semester: 3rd B.Tech. (Electrical Engineering), Session: 2020-21

Subject: Network Theory, (Subject Code: 1303)

Branch: Electrical & Electronics Engineering,

Name of Faculty: Dr. Gyan Ranjan Biswal

| Period | Module No. | Topics to be Covered   | Signature of Faculty  |
|--------|------------|--|---|
| 1      | I          | MODULE-I -> <i>Coupled Circuits</i> : Defining Self Inductance and Mutual Inductance; Interrelation between Self and Mutual Inductances in a coupled circuit; Coefficient of coupling and Dot conversion   |    |
| 2      | I          | Equivalent inductance in series connected mutually coupled network using dot conversion; Equivalent inductance in a parallel/ shunt connected mutually coupled network using dot conversion, Some practice problems; Ideal Transformers: definition and assumptions; Linear transformer; Coupled circuits as a Transformer |   |
| 3      | I          | Introducing <i>Transient and Steady State Analysis</i> ; Time domain analysis of First order networks: RL and RC types   |   |
| 4      | I          | Second order network: RLC circuits; RL, RC and RLC networks using Laplace Transform  |   |
| 5      | I          | Both Time domain and Frequency domain analysis with DC and AC (sinusoidal) excitations; Response to Forced Inputs: Step, Impulse and Ramp types  |   |
| 6      | I          | Doubt session and Test - I   |   |
| 7      | II         | MODULE-II -> <i>Two-Port Networks</i> : two port parameters; Open circuit Impedance (Z) parameter  |  |
| 8      | II         | Short circuit Admittance (Y) parameter   |   |
| 9      | II         | Image and Hybrid parameters  |   |
| 10     | II         | Transmission (ABCD) parameter  |   |
| 11     | II         | Ideal Two port devices e.g. Ideal Transformers, Tee and Pie circuit representation; Cascade and Parallel Connections   |   |
| 12     | II         | Doubt session and Test - II  |  |
| 13     | II         | MODULE-III -> <i>Network Function &amp; Responses</i> : concept of complex frequency, Driving point and transfer functions for one port and two port networks  |   |
| 14     | II         | Poles and Zeros of network functions; Restrictions on Pole and Zero locations of network functions;  |   |
| 15     | II         | Impulse response and Complete response   |   |
| 16     | II         | <i>Three phase circuits</i> : analysis of unbalanced loads; Neutral shift and Symmetrical components; Analysis of unbalanced system  |   |
| 17     | II         | Power in terms of unbalanced and balanced loads; Power in terms of symmetrical components  |   |
| 18     | II         | Doubt session and Test - III   |   |
| 19     | III        | MODULE-IV -> Network Synthesis: Introduction, realizability concept  |   |

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| 20 | III | Hurwitz property and Positive realness, properties of positive real functions                           |  |
| 21 | III | Synthesis of RL, RC, and LC driving point functions   |   |
| 22 | III | Foster Forms  |   |
| 23 | III | Cauer Forms   |   |
| 24 | III | Doubt session and Test - IV   |   |
| 25 | IV  | MODULE-V -> <i>Graph Theory</i> : Introduction, Linear graph of a network, Tie-set and Cut-set schedule |  |
| 26 | IV  | Incidence matrix, analysis of resistive network using Tie-set   |   |
| 27 | IV  | Analysis of resistive network using Cut-set, dual of a network  |   |
| 28 | IV  | Filters: classification of filters  |   |
| 29 |     | Characteristics of Ideal filters  |   |
| 30 | IV  | Doubt session and Test - V  |   |

Signature of the Faculty

Signature of HOD (EEE)