

**Lesson plan (for Even-semester as per revised curriculum and study scheme)**

| <b>Name of Faculty</b>    |            | <b>Lokesh</b>   |            |   |
|---------------------------|------------|---|------------|---|
| <b>Discipline</b>         |            | <b>Electrical Engineering</b>   |            |   |
| <b>Semester</b>           |            | <b>2<sup>nd</sup> (Even- semester)</b>  |            |   |
| <b>Subject</b>            |            | <b>ELECTRICAL NETWORKS</b>  |            |   |
| <b>Lesson Plan</b>        |            | <b>From 15 feb 2024 to 14 June 2024</b>   |            |   |
| <b>Work load (Theory)</b> |            | <b>(03+04)</b>  |            |   |
| <b>Week</b>               | <b>Day</b> | <b>Topics</b>   | <b>No.</b> | <b>Practical</b>  |
| 1st                       | 1          | Mesh analysis   | 1          | Use voltmeter, ammeter to determine current through the given branch of a electric network by applying mesh analysis. |
|                           | 2          | Nodal analysis using voltage and current sources  |            |   |
|                           | 3          | Superposition theorem   |            |   |
| 2nd                       | 1          | Thevenin theorem  | 2          | Use voltmeter, ammeter to determine current through the given branch of a electric network by applying node analysis. |
|                           | 2          | Norton theorem  |            |   |
|                           | 3          | Maximum power transfer theorem  |            |   |
| 3rd                       | 1          | Revision of Chapter 1   | 3          | Viva-voice  |
|                           | 2          | Active and passive network, Linear and Non Linear network                                   |            |   |
|                           | 3          | Problem solution based on above theorems  |            |   |
| 4th                       | 1          | Generation of alternating Voltage and current.  | 4          | . Verification of Superposition Theorem   |
|                           | 2          | Difference between ac and dc  |            |   |
|                           | 3          | Equation of alternating quantity.   |            |   |
| 5th                       | 1          | AC Terminology: waveform, cycle, frequency, time period, amplitude                          | 5          | .. Verification of Thevenin's theorem   |
|                           | 2          | Instantaneous value, alternation, and their important relations (time period and frequency, |            |   |
|                           | 3          | Angular velocity and frequency etc.)  |            |   |
| 6th                       | 1          | Values of alternating voltage and current: Instantaneous value,                             | 6          | . viva-voice  |
|                           | 2          | peak value averagevalue,  |            |   |
|                           | 3          | R.M.S. value, form factor and peak factor   |            |   |
| 7th                       | 1          | Vector representation of alternating quantities   | 7          | Verification of Norton's Theorems   |
|                           | 2          | Concept of phase, phase difference and phasors  |            |   |
|                           | 3          | Representation of electrical quantities through phasors                                     |            |   |
| 8th                       | 1          | Addition of two alternating quantities: parallelogram method,                               | 8          | Verification of Maximum Power transfer Theorem  |
|                           | 2          | A.C circuit containing pure Resistance, Inductance,   |            |   |
|                           | 3          | A.C circuit containing pure Capacitance with the concept of Component method power consumed |            |   |
|                           | 1          | Phase Angle, inductive and capacitive reactance etc.  |            |   |

|      |   |  |    |   |
|------|---|--|----|---|
| 9th  | 2 | AC series circuit: R-L, R-C, R-L-C along with the concept of phasor diagram        | 9  | Viva-voice  |
|      | 3 | Concept of Phase angle , Impedance   |    |   |
| 10th | 1 | Concept of impedance triangle  | 10 | . Observe the wave shape of an alternating supply on CRO and calculate average, RMS value, frequency and time period. |
|      | 2 | Revision of Chapter 2  |    |   |
|      | 3 | Concept of power, power triangle etc.  |    |   |
| 11th | 1 | Concept of True power, apparent power and reactive power,                          | 11 | . Measure input current, power, power factor of R-L series circuit and draw the power triangle.                       |
|      | 2 | Significance, disadvantages of low power factor                                    |    |   |
|      | 3 | Cause of low power factor  |    |   |
| 12th | 1 | Power factor and its improvement of power factor.                                  | 12 |   |
|      | 2 | Active and reactive components of current  |    |   |
|      | 3 | Resonance in RLC series circuit, Quality (Q) factor                                |    |   |
| 13th |   | Concept of AC parallel circuit   | 13 |   |
|      |   | Methods of solving parallel AC circuit: vector method,                             |    |   |
|      |   | Admittance method, symbolic or J-method  |    |   |
| 14th |   | Parallel Resonance, Q-factor   | 14 |   |
|      |   | Comparison of series and parallel resonance.                                       |    |   |
|      |   | Introduction to transient and Harmonics in A.C. circuits                           |    |   |
| 15th |   | Principle of generation of 3- $\phi$ alternating emf                               |    |   |
|      |   | Advantages of Polyphase circuit over single phase circuit                          |    |   |
|      |   | Phase Sequence   |    |   |
| 16th | 1 | Types of three phase connections-Star connection and delta connection.             |    |   |
|      | 2 | Concept of balanced and unbalanced load.   |    |   |
|      | 3 | Relation between phase and line quantities of star and delta connection.           |    |   |
| 17th | 1 | Poly-Phase Systems ,Advantages of 3 $\phi$ over 1- $\phi$                          |    |   |
|      | 2 | System Star & delta connections with phase and line voltage and current relations. |    |   |
|      | 3 | 3-phase balanced and unbalanced circuits   |    |   |
| 18th | 1 | Power in 3-phase circuits  |    |   |
|      | 2 | Revision/Review/Test of old HSBTE Papers   |    |   |
|      | 3 | Revision/Review/Test of old HSBTE Papers   |    |   |