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| **Govt. Polytechnic, Nilokheri** **Electrical Engineering Department** |
| **Lesson plan (for Even-semester as per revised curriculum and study scheme)** |
| **Name of Faculty** | **Sh. Ajay Kishor** |
| **Discipline** | **Electrical Engineering** |
| **Semester** | **2nd (Even- semester)** |
| **Subject** | **ELECTRICAL NETWORKS** |
| **Lesson Plan Duration** | **From March 2023 to June 2023** |
| **Work load (Theory + Practical ) Per Week** | **(03+04)** |
| **Week** | **Day** | **Topics** | **No.** | **Practical** |
| 1st | 1 | Mesh analysis | 1 | Use voltmeter, ammeter to determine current through the given branch of a electricnetwork 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 electricnetwork by applying node analysis. |
| 2 | Norton theorem |
| 3 | Maximum power transfer theorem |
| 3rd | 1 | Active and passive network, Linear and Non Linear network | 3 | Verification of Superposition Theorem. |
| 2 | Problem solution based on above theorems |
| 3 | Generation of alternating Voltage and current. |
| 4th | 1 | Difference between ac and dc, Equation of alternating quantity. | 4 | Verification of Thevenin’s theorem. |
| 2 | AC Terminology: waveform, cycle, frequency, time period, amplitude |
| 3 | Instantaneous value, alternation, and their important relations (time period and frequency,  |
| 5th | 1 | Angular velocity and frequency etc.) | 5 | Verification of Norton’s Theorems. |
| 2 | Values of alternating voltage and current: Instantaneous value, peak value average value, |
| 3 | R.M.S. value, form factor and peak factor |
| 6th | 1 | Vector representation of alternating quantities | 6 | Verification of Maximum Power transfer Theorem. |
| 2 | Concept of phase, phase difference and phasors |
| 3 | Representation of electrical quantities through phasors |
| 7th | 1 | Addition of two alternating quantities: parallelogram method,  | 7 | Observe the wave shape of an alternating supply on CRO and calculate average, RMSvalue, frequency and time period. |
| 2 |  A.C circuit containing pure Resistance, Inductance, Capacitance with the concept of Component methodpower consumed, |
| 3 | Phase Angle, inductive and capacitive reactance etc. |
| 8th | 1 | AC series circuit: R-L, R-C, R-L-C along with the concept of phasor diagram, | 8 | Measure input current, power, power factor of R-L series circuit and draw the powertriangle. |
| 2 | Phase angle , Impedance, impedance triangle, power, power triangle etc. |
| 3 | Concept of True power, apparent power and reactive power,  |
| 9th | 1 | Significance, disadvantages of low power factor, cause of low power factor, | 9 | Measure input current, power, power factor of R-C series circuit and draw the powertriangle. |
| 2 | Power factor and its improvement of power factor. |
| 3 | Active and reactive components of current |
| 10th | 1 | Resonance in RLC series circuit, Quality (Q) factor | 10 | Measure input current, power, power factor of R-L-C series circuit and draw the powertriangle. |
| 2 | Concept of AC parallel circuit |
| 3 | Methods of solving parallel AC circuit: vector method,  |
| 11th | 1 | Admittance method, symbolic or J-method | 11 | Use variable frequency supply to create resonance in given series R-L-C circuit or byusing variable inductor or variable capacitor. |
| 2 | Parallel Resonance, Q-factor |
| 3 | Comparison of series and parallel resonance. |
| 12th | 1 | Introduction to transient and Harmonics in A.C. circuits | 12 | To determine current, p.f., active, reactive and apparent power in R-C parallel A.C.circuit. |
| 2 | 5.1 Principle of generation of 3 –ø alternating emf. |
| 3 | Advantages of Polyphase circuit over single phase circuit, Phase Sequence. |
| 13th | 1 | Types of three phase connections-Star connection and delta connection. | 13 | To determine current, p.f., active, reactive and apparent power for given R-L-C parallelcircuit with series connection of resistor and inductor in parallel with capacitor. |
| 2 | Concept of balanced and unbalanced load. |
| 3 | Relation between phase and line quantities of star and delta connection. |
| 14th | 1 | Poly-Phase Systems ,Advantages of 3Ø over 1- Ø | 14 | Use variable frequency supply create resonance in given parallel R-L-C circuit or byusing variable inductor or capacitor. |
| 2 | System Star & delta connections with phase and line voltage and current relations. |
| 3 | 3-phase balanced and unbalanced circuits |
| 15th | 1 | Power in 3-phase circuits |   |   |
| 2 | Revision/Review/Test of old HSBTE Papers |
| 3 | Revision/Review/Test of old HSBTE Papers |