**Lecture Plan**

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| S. No. | Lecture No. | Topic to be discussed | Objective of lecture | Outcome of Lecture |
| 1 | 1 | **UNIT -1**  **INTRODUCTION TO UNIT**  **Introduction**  **1.1Introduction to circuit element and characteristics**  1.1.1 Resistance  1.1.2 Inductance  1.1.3 Capacitance    **1.2 Current and Voltage References** 1.2.1 Voltage Source  1.2.1.1 Independent voltage source  1.2.1.2 Dependent voltage source  1.2.2 Current Source  1.2.2.1 Independent current source  1.2.2.2 Dependent current source  **Conclusion** | To study the **circuit element and characteristics** | Analyze the **circuit element and characteristics** |
|  | 2 | **Introduction**  **1.3 Response to single element circuit**  1.3.1 Resistive circuit  1.3.2 Inductive circuit  1.3.3 Capacitive circuit    **1.4 Response to double element circuit**  1.4.1 Series RL circuit  1.4.2 Series RC circuit  1.4.3 Parallel RL circuit  1.4.4 Parallel RC circuit  **Conclusion** | To study the response of elements circuit when connected in series and parallel | Analyze the response of elements circuit when connected in series and parallel |
|  | 3 | **Introduction**  **1.5 Response to triple element circuit**  1.5.1 Series RLC circuit  1.5.2 Parallel RLC circuit  **Conclusion** | To study the response of series and parallel RLC circuit | Analyze the response of series and parallel RLC circuit |
|  | 4 | **Introduction**  **1.5 Resonance**  1.5.1 Series Resonance  1.5.1.1 Properties of resonance of  series RLC circuit  1.5.1.2 Variation of R,L,C with frequency  1.5.1.3 Q factor of series RLC circuit  1.5.1.4 Bandwidth and its relation with Q factor  1.5.1.5 Selectivity  **Conclusion** | To study the resonance, quality factor, bandwidth | Analyze the resonance, quality factor, bandwidth |
|  | 5 | **Introduction**  1.5.1.6 Relation with fractional detuning  factor and Quality factor at resonance  1.5.1.7 Expression of half power in  series RLC resonating circuit &  relation between f0,f1,f2  1.5.1.8 Frequencies at which Vc and Vl are max.  1.5.1.9 Effect of frequency on the frequency response curve  **Conclusion**  **Introduction**  1.5.1 Parallel Resonance  1.5.2.1 Properties of resonance of  parallel LRC circuit  1.5.2.1.1 Variation of capacitive  susceptance , impedance and  current with frequency 1.5.2.1.2 Quality factor  **Conclusion** | To study the resonance, quality factor, bandwidth | Analyze the resonance, quality factor, bandwidth |
| 40 | 6 | **Introduction**  1.5.2.1.3 Relation with detuning  factor, Quality factor,  impedance and selectivity of  parallel resonating circuit  1.5.2.2 Resonance between parallel RC  And RL circuit  1.5.2.3 Parallel Resonance of RLC  Circuit  1.5.2.3.1 Quality factor  **Conclusion** | To study the relation between with detuning  factor, Quality factor,  impedance and selectivity of  parallel resonating circuit | Analyze the relation between with detuning  factor, Quality factor,  impedance and selectivity of  parallel resonating circuit |
|  | 7 | **Introduction**  **1.6 Network Analysis**  1.6.1 Network voltages  1.6.1.1 Kirchoff’s current law  1.6.1.2 current division  1.6.1.3 Kirchoff’s voltage law  1.6.1.4 Voltage division  **Conclusion** | To study the network analysis | Analyze the network analysis |
|  | 8 | **Introduction**  1.6.2 Nodal Analysis  1.6.2.1 Super node  1.6.3 Mesh Analysis  1.6.3.1 Super mesh  1.6.4 Graph of network  **Conclusion** | To study nodal analysis, supernode, supermesh | Analysis nodal analysis, supernode, supermesh |
|  | 9 | **Introduction**  1.6.4.1 terminology used in network  Graph  1.6.4.1.1Node  1.6.4.1.2 degree of a node  1.6.4.1.3 tree branch  1.6.4.1.4 tree link  1.6.4.1.5 loop  1.6.4.1.6 cut set  1.6.4.1.7 tie set  1.6.4.1.7 network variable  1.6.4.1.8 sub graph  1.6.4.1.9 path  1.6.4.1.10 connected graph  1.6.4.1.11 incidence matrix  1.6.4.1.12 twigs and links and  Relation between them  1.6.4.2 Properties of tree in a graph  **Conclusion** | To study the graph theory | Analysis the graph theory |
|  | 10 | **Introduction**  1.6.4.3 formation of a incidence matrix  1.6.4.3.1 properties  1.6.4.3.2 reduced incidence matrix  1.6.4.4 no. of trees in a graph  1.6.4.5 cut set matrix  1.6.4.6 tie set matrix  **Conclusion** | To study the incidence, cut set and tie set matrix | Analyze the incidence, cut set and tie set matrix |
|  | 11 | **Introduction**  1.6.5 duality and methods of obtaining dual network  **Conclusion**  **Conclusion to unit** 1  **Quiz** | To study the duality | Analysis the duality |
|  | 12 | **Numerical problems** |  |  |
|  | 13 | **UNIT 2**  **NETWORK THEOREMS**  Introduction to unit | To study the network theorem | Analysis the network theorm |
|  | 14 | **2.1 Thevenin’s theorem**  2.1.1 statement  2.1.2 Explanation  2.1.3 steps for solving the n/w using theorem  2.1.4 different methods of finding Rth  **2.2 Norton’s theorem**  2.2.1 statement  2.2.2 Explanation  2.2.3 steps for solving the n/w using theorem  **Conclusion** | To study the thevenin and Norton theorem | Analyze the thevenin and Norton theorem |
|  | 15 | **Introduction**  **2.3 Superposition theorem**  2.3.1 statement  2.3.2 Explanation  2.3.3 steps for solving the n/w using theorem  **2.4 Maximum power transfer**  2.8.1 statement  2.8.2 Explanation  2.8.3 steps for solving the n/w using theorem  **Conclusion** | To study the superposition and maximum power theorem | Analyze the superposition and maximum power theorem |
|  | 16 | **Introduction**  **2.5Reciprocity theorem**  2.4.1 statement  2.4.2 Explanation  2.4.3 steps for solving the n/w using theorem  **2.6Compensation theorem**  2.5.1 statement  2.5.2 Explanation  2.5.3 steps for solving the n/w using theorem  **Conclusion** | To study the reciporicity and compensation theorem | Analyze the reciporicity and compensation theorem |
|  | 17 | **Introduction**  **2.7 Mill man’s theorem**  2.6.1 statement  2.6.2 Explanation  2.6.3 steps for solving the n/w using theorem  **2.8 Millers’**  2.9.1 statement  2.9.2 Explanation  2.9.3 steps for solving the n/w using theorem  **2.9Tellegen’s**  2.7.1 statement  2.7.2 Explanation  2.7.3 steps for solving the n/w using theorem  **Conclusion**  **Revision**  **Conclusion to unit** | To study the millman’s theorem , miller’s and tellegen’s theorem | Analyze the millman’s theorem , miller’s and tellegen’s theorem |
|  | 18 | **OBT**  Numerical problems |  |  |
|  | 19 | **UNIT 3 POLY PHASE CIRCUITS**  Introduction to unit  **Introduction**  **3.1 General circuit relations**  3.1.1 Advantages of three phase systems  3.1.2 Three phase star connection  3.1.2.1 relationship between line and phase  voltages and current  3.1.2.2 Phasor diagram  3.1.2.3 Power in a star connection  Conclusion  Introduction  3.1.3 Three phase delta connection  3.1.3.1 relationship between line and phase  voltages and current  3.1.3.2 Phasor diagram  3.1.3.3 Power in a star connection  **Conclusion** | To study the three phase system and relation between voltage and current | Analyze the three phase system and relation between voltage and current |
|  | 20 | **Introduction**  3.1.4 star and delta combination  3.1.4.1 relationship between line and phase  voltages and current  3.1.4.2 Phasor diagram  3.1.4.3 Power calculations  **Conclusion** | To study the star and delta combination | Analyze the star and delata combination |
|  | 21 | **Introduction**  3.1.5Four wire star connection  3.1.5.1 relationship between line and phase  voltages and current  3.1.5.2Power and reactive volt amperes in a 3  Phase system  **Conclusion** | To study the four wire system | Analyze the four wire system |
|  | 22 | **Introduction**  **3.2 Power Relations in AC Circuits**  3.2.1 Instantaneous Power in AC Circuits  3.2.2 Average Power  3.2.3 Apparent Power  3.2.4 Power Factor  3.2.5 Reactive Power  3.2.6 Power Triangle  3.2.7 Complex Power  **Conclusion**  **Numerical problems** | To study the real, apperant and reactive power and their relation | Analyze the real, apperant and reactive power and their relation |
|  | 23 | **Objective questions** |  |  |
|  | 24 | **UNIT 4 Non Sinusoidal Waves**  Introduction to unit  Complex Periodic Waves and their Analysis by Fourier Series | To study the complex and fourier series | Analyze the complex and fourier series |
|  | 25 | **Introduction**  **4.1 Basic Types of Special Functions**  4.1.1 Shifted Unit Step Function  4.1.2 Ramp Function  4.1.3 Impulse Function  4.1.4 Unit Doubled Function  **4.2 Different kinds of Symmetry**  4.2.1 Even Function  4.2.2 Odd Function  4.2.3 Half Wave  **Conclusion** | To study the step , ramp, impulse, even and odd function | Analyze the step , ramp, impulse, even and odd function |
|  | 26 | **Introduction**  **4.3 Determination of Coefficients**  4.3.1 Even Function Symmetry  4.3.2 Odd Function Symmetry  4.3.3 Half Function Symmetry  **Conclusion** | To study the function symmetry | Analyze the function symmetry |
|  | 27 | **Introduction**  **4.4 average value of non sinusoidal wave**  **4.5 effective values of non sinusoidal wave**  **4.6 power in a circuit of non sinusoidal wave of voltages and current**  **4.7form factor**  **Conclusion** | To study the average , rms value, form factor, peak factor | Analyze the average , rms value, form factor, peak factor |
|  | 28 | **Introduction**  **4.8 equivalent sinusoidal wave and equivalent power factor**  **4.9 response of linear networks to non sinusoidal periodic waveform**  **Conclusion**  **Conclusion to unit 4** | To study the response of sinusoidal wave | Analyze the response of sinusoidal wave |
|  | 29 | **Numerical problems** |  |  |
|  | 30 | **UNIT 5**  **TIME DOMAIN AND FREQUENCY DOMAIN ANALYSIS**  **Introduction to unit 5** | To study the time domain and frequency domain | Analyze the time domain and frequency domain |
|  | 31 | **Introduction**  **5.1Introduction to Laplace Transform**  5.1.1Laplace transform  5.1.2Inverse Laplace transform  **Conclusion** | To study the laplace transform | Analyze the laplace transform |
|  | 32 | **Introduction**  5.1.3 Laplace transform of some functions  5.1.3.1 Unit step  5.1.3.2 ramp  5.1.3.3 unit impulse  5.1.3.4 pulse  5.1.3.5 sinusoidal  5.1.3.6 others  **Conclusion** | To study the laplace transform of different function | Analyze the laplace transform of different function |
|  | 33 | **Introduction**  5.1.4Initial and final value theorem  5.1.5 shifting theorem  5.1.6 time domain and frequency domain analysis  5.1.6.1 constant voltage source  5.1.6.2 Time dependent voltage source  5.1.6.3 current source  5.1.6.4 Time dependent current source  **Conclusion** | To study the properties of laplace transform | Analyze the properties of laplace transform |
|  | 34 | **Introduction**  5.1.6.5 resistive element  5.1.6.6 inductive element  5.1.6.7 capacitive element  5.1.6.8 mutual inductance between two coils  **Conclusion** | To study the types of elements | Analyze the types of elements |
|  | 35 | **Introduction**  **5.2 Response of networks**  5.2.1 step response of RL circuit  5.2.2 step response of RC circuit  5.2.3 impulse response of series RL circuit  5.2.4 impulse response of series RC circuit  **Conclusion** | To study the response of series circuit | Analyze the response of series circuit |
|  | 36 | **Introduction**  5.2.5 pulse response of series RL circuit  5.2.6 pulse response of series RC circuit  5.2.7 step response of RLC circuit  **Conclusion**  **Conclusion to unit 5** | To study the pulse response of series circuit | Analyze the pulse response of series circuit |
|  | 37 | **Numerical problems** |  |  |
|  | 38 | **SOLVING IMPORTANT QUESTIONS** |  |  |
|  | 39 | **LAST YEAR PAPER SOLVING**  **REVISION(ACCORDING TO UNIVERSITY PATTERN** |  |  |
|  | 40 | **IMPORTANT NUMERICAL PROBLEMS** |  |  |