SYLLABUS

EC3251 **CIRCUIT ANALYSIS** L T P C
3 1 0 4

UNIT I DC CIRCUIT ANALYSIS (12)

Basic Components of electric Circuits, Charge, Current, Voltage and Power, Voltage and Current Sources, Ohms Law, Kirchoff's Current Law, Kirchoff's voltage law, The single Node - Pair Circuit, series and Parallel Connected Independent Sources, Resistors in Series and Parallel, Voltage and Current division, Nodal analysis, Mesh analysis.

UNIT II NETWORK THEOREMS AND DUALITY (12)

Useful Circuit Analysis techniques - Linearity and superposition, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer, Delta-Wye Conversion. Duals, Dual circuits. Analysis using dependent current sources and voltage sources.

UNIT III SINUSOIDAL STEADY STATE ANALYSIS (12)

Sinusoidal Steady - Stage analysis, Characteristics of Sinusoids, The Complex Forcing Function, The Phasor, Phasor relationship for R, L and C, impedance and Admittance, Nodal and Mesh Analysis, Phasor Diagrams, AC Circuit Power Analysis, Instantaneous Power, Average Power, apparent Power and Power Factor, Complex Power.

UNIT IV TRANSIENT AND RESONANCE IN RLC CIRCUITS (12)

Basic RL and RC Circuits, The Source - Free RL Circuit, The Source-Free Circuit, The Unit-Step Function, Driven RL Circuits, Driven RC Circuits, RLC Circuits, Frequency Response, Parallel Resonance, Series Resonance, Quality Factor.

UNIT V COUPLED CIRCUITS AND TOPOLOGY (12)

Magnetically Coupled Circuits, Mutual Inductance, the Linear Transformer, the Ideal Transformer, An introduction to Network Topology, Trees and General Nodal analysis, Links and Loop analysis.

TOTAL: 60 PERIODS

SYLLABUS

BM3352 – ELECTRIC CIRCUIT ANALYSIS

UNIT I: BASIC CIRCUITS ANALYSIS 9

Basic Components of electric Circuits, Charge, current, voltage and power, voltage and current sources, Ohms Law, Kirchoff's Laws, Mesh current and node voltage method of analysis for D.C and A.C. circuits. The single Node – Part Circuit, series and parallel Connected Independent sources, Resistors in series and parallel, voltage and current division, Nodal analysis, Mesh analysis.

UNIT II: NETWORK THEOREM AND DUALITY 9

Useful Circuit Analysis techniques - Linearity and superposition. Thevening and Norton Equivalent Circuits. Maximum power transfer, application of Network theorems. Network reduction voltage and current division, source transformation, Delta-Wye conversion duals, Dual circuits.

UNIT III: SINUSOIDAL STEADY STATE ANALYSIS 9

Sinusoidal steady – State analysis, Characteristics of sinusoidals. The complex forcing function, The Phasor, Phasor relationship for R, L, and C, impedance and Admittance, Nodal and Mesh Analysis, Phasor Diagrams, AC Circuit Power Analysis, Instantaneous Power, Average power, apparent power and power factor, complex power.

UNIT IV: TRANSIENTS AND RESONANCE IN RLC CIRCUITS 9

Basic RL and RC circuits, The source-free RL circuit, The Source-Free RC Circuit. The Unit step function, Driven RL Circuits, Driven RC Circuits, RLC Circuits, Frequency Response, Parallel Resonance, Series Resonance, Quality factor.

UNIT V: COUPLED CIRCUITS AND TOPOLOGY 9

Magnetically coupled circuits, mutual inductance, the Linear Transformer, the Ideal Transformer, An introduction to Network Topology, Trees and General Nodal analysis, Links and Loop analysis.

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