Unit I

Syllabus : Kirchhoff's current and voltage laws, Independent and dependent sources and their interconnection, Power calculations, Network analysis : Mesh, Super mesh, Node and super node analysis, Source transformation and source shifting, Network theorems : Superposition, Thevenin's, Norton's and maximum power transfer (Analysis of simple dc circuits using all above techniques and analysis of simple AC circuits using only mesh analysis).

Unit II

Syllabus : Initial conditions, Driven RL and RC circuits, source free RL and RC circuits, properties of exponential response, Natural and Forced response of RL and RC circuits. Introduction to driven and Source free series RLC circuit. Over damped and Under damped series RLC circuit.

Syllabus : Terminal characteristics of network, Z, Y, h, ABCD parameters ; Reciprocity and symmetry conditions, Applications of the parameters. Application of laplace transforms to circuit analysis, Network functions for one port and two port networks, Poles and zeros of network functions and network stability.

Unit IV

Syllabus : Construction, Working principle, Derivation of EMF equation, Types, Voltage equation of DC generator, Working principle, Derivation of torque equation, Types, Voltage equation and speed equation of DC motor, Basic characteristics and different methods of speed control of DC shunt and DC series motors, Power flow diagram of DC motor, Numericals on speed and torque, Need of starters, Three point and four point starter for DC shunt motor, Applications of DC Motors, Permanent Magnet DC motors (PMDC) : Construction, Working and applications.

Unit V

Syllabus : Three phase induction motors, Construction, Working principle, Types, Concept of slip, Effect of slip on rotor parameters, Derivation of torque equation, Condition for maximum torque, Torque ratios, Torque-slip characteristics, Power flow diagram with numerical, Necessity of starters : Study of DOL and star-delta starters, Speed control using V/f method, Applications.

Syllabus : Introduction to electric vehicle, Block diagram, Case study of any one electric vehicle with respect to specifications of motor, Battery and controller.

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