Basic Electrical Engineering

Teaching Scheme: 2 Hours/Week
Credit: 02
TU: 35 Marks TI: 15 Marks Total Marks: 50

Unit 1: Electric Circuits: EMF, Potential difference, current, power, Energy (Definition & Units SI), Ohms Law, types of sources (Current & Voltage), Ideal and Practical Sources (Independent Sources only), Source Conversion, Superposition theorem with DC source. Circuit element resistance, factors affecting resistance, series & parallel combination of resistances, Kirchhoff's Laws (KVL, KCL) statement & Numerical, Circuit Element Inductance, Self and Mutual Inductance, Circuit Element Capacitance. (8Hrs)

Unit 2: Magnetic Circuits: Types of Magnetic Materials, flux, flux density, flux intensity, MMF, reluctance, permanence, permeability, analogous electric circuit, calculation for composite magnetic circuit, concept of leakage flux and fringing, B-H curve, phenomena of magnetic hysteresis. (6Hrs)

Unit 3: AC Circuits: Generation of single phase voltage, average and RMS value for sinusoidal waveform, phasor representation of sinusoidal electrical quantities, reactance, impedance, power and energy in AC circuit, simple numerical on series AC circuit, concept and importance of power factor, resonance in series circuits. Principal of Generation of three phase voltage, Phase sequence, Star & Delta Connected three phase system, Voltage, Current & Power relations for balanced three phase system

(10 Hrs)

Unit 4: Single Phase Transformer: Basic construction of Transformer (core & shell type), Principle of operation, EMF equation, Transformer ratings, No load & On load operation with leakage reactance, losses, efficiency, Definition & formula for voltage regulation. (6Hrs)

(Dr. S. M. Kelo)
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