SUBJECT : ELECTRICAL ENGINEERING

Electrical Circuit: Network Theorems and applications. Transient and steady – state analysis of electric circuit. Transform techniques in circuit analysis. Resonant circuits. Coupled Circuits. Balanced three phased circuits. Two port networks. Network parameters. Elements of network synthesis, active filters.

E-M Theory: Electrostatic and magnetostatic fields. Maxwell's equations. Wave equations and electromagnetic waves. Antennas and wave Propagation. Transmission line microwave resonators, wave guides.

Control Systems: Mathematical modelling and simulation of physical dynamic systems. Transfer function, Time response and frequency response of linear's system. Bode plot and Nicho's chart. Stability of linear feedback control system Routh Hurwiz and Nyquist criteria of stability Steady state-error, Root-locus diagrams. Basic concepts in compensator design, State variable methods in system modelling, analysis and design. Controllability and obserbility, Control system components, Error detectors and Actuators.

Measurement and Instrumentation : Electrical standards, Error analysis, Measurement quantities like current, voltage, power, energy, power-factor etc., measurement or resistance, inductance capacitance and frequency, Indicating instrument, Bridge measurements. Electronic Measuring instruments, Electronic multimeter, CRO, digital voltmeter, Frequency counter. Q-meter, spectrum analyzer, distortion-meter, etc. Transducers, Thermocouple, thermistor, LVDT, strain gauges, prezo-electric crystal, etc. Use of transducers in the measurements of non-electrical quantities like temperature, pressure, flow-rate, displacement acceleration noise level etc. Data acquisition systems.

Electronics : Semi Conductors and semi-conductor devices Equivalent circuits. Transistors biasing, analysis of all types of amplifiers including feedback, d-c amplifiers, Integrated Circuits.

Operational amplifier and its applications, Analog Computers.

Oscillators and wave form generators, Multivibrators Digital electronic : Logic gates, Boolean algebra, combinational and sequential circuits arithmetic operations, Memories, A/D and D/A converts, Microprocessors.

Communication Engineering : Amplitude, frequency and phase modulation, their generation and demodulation, Noise.

Sampling and pulse modulation, PCM and Delta Modulation.

Line and Radio communication systems. Elements of satellite communication, Principles of Television Engineering, Rader Engineering, Radio Aids to Navigation.

Electrical Machines : D-C Machines: Characteristics and performance analysis of motors and generators. Applications, Starting and speed control of motors.

A-C Generators : Construction and performance analysis. Measurement of machine parameters. Single and three phase induction motors. Principles of operation and performance characteristics. Starting and speed control.

Synchronous motors : Principles of operation performance analysis, Synchronous condensers.

Power Transformers : Principles of operation and performance analysis, Tap changing on load.

Power Electronic : Thyristors, Converters and Inverters, Speed control techniques for drives.

Power systems : Modelling of power transmission lines, Steady, State analysis and Performance of Transmission systems, Surge Phenomena, Insulation co-ordination, Protective devices and schemes for power Systems equipment. HVDC Transmission.