DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

PHD ENTRANCE SYLLABUS

Objective: This subject deals with the general concept of distribution system, substations and feeders as well as discusses distribution system analysis, protection and coordination, voltage control and power factor improvement.

The subject also deals with basic concepts of various isolated and non isolated converters. It also focuses on the basic concepts of neural network and fuzzy logic.

UNIT – I

General Concepts: Introduction to distribution systems, Load modeling and characteristics – Coincidence factor – Contribution factor loss factor – Relationship between the load factor and loss factor – Classification of loads (Residential, commercial, Agricultural and Industrial) and their characteristics.

Substations: Location of substations: Rating of distribution substation – Service area within primary feeders – Benefits derived through optimal location of substations. Distribution Feeders Design Considerations of distribution feeders: Radial and loop types of primary feeders – Voltage levels – Feeder loading – Basic design practice of the secondary distribution system.

System Analysis: Voltage drop and power–loss calculations: Derivation for voltage drop and power loss in lines – Manual methods of solution for radial networks – Three phase balanced primary lines.

Basics of Power Electronics Device: Introduction to various non isolated DC-DC converters like buck, boost, buck-boost and cuk converters, isolated converters like fly back, pushpull and forward converters-Circuit with working principle. Various AC-DC and DC-AC converters with working principle.

Electro-physiological Measurement: Electroencephalogram (EEG), Electrocardiogram (ECG), Electromyogram (EMG), Mechanomyogram (MMG), Electrooculography (EOG),Electroretionography (ERG)

UNIT – II

Protection: Objectives of distribution system protection – Types of common faults and procedure for fault calculations – Protective devices: Principle of operation of fuses.

Compensation for Power Factor Improvement: Capacitive compensation for power–factor control – Different types of power capacitors – shunt and series capacitors – Effect of shunt capacitors (Fixed and switched) – Power factor correction – Capacitor allocation – Economic justification – Procedure to determine the best capacitor location.

Voltage Control: Voltage Control: Equipment for voltage control – Effect of series capacitors – Effect of AVB/AVR –Line drop compensation.

Neural Network: Structure of neural network, Back-Propagation Algorithm, Radial Basis network, Associative Memory

Fuzzy Logic: Introduction to classical sets – properties, Operations and relations; **Fuzzy** sets, Membership, Operations, properties, **fuzzy** relations

Medical Imaging and Telemetry: X-RAY machine, Computer Tomography, Magnetic Resonance Imaging System, Ultra Sonography, different types of telemetry system