

**UNIT 1****Chapter 1 : Distribution Systems 1-1 to 1-36**

Syllabus : Classification of supply systems (State Only) (i) DC, 2-wire system, (ii) Single phase two wire ac system, (iii) Three phase three wire ac supply system, (iv) Three phase four wire ac supply system. Comparison between overhead and underground systems (For above mentioned systems) on the basis of volume requirement for conductor. AC Distribution System : Types of primary and secondary distribution systems, calculation of voltage drops in ac distributors (Uniform and Non Uniform Loading) (Numerical) Economics of power transmission : Economic choice of conductor (Kelvin's law) (Derivation and Numerical) Distribution Feeders: Design considerations of distribution feeders; radial and ring types of primary feeder's voltage levels, energy losses in feeders.

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UNIT 2

Chapter 2 : Substation and Earthing 2-1 to 2-33

Syllabus : Substation : Classification of substations, Various equipments used in substation with their specifications, Bus bar arrangements in the substation: Simple arrangements like single bus bar, sectionalized single bus bar, main and transfer bus bar system with relevant diagrams. Earthing : Necessity of Earthing, Types of earthing system (Equipment and Neutral), and Maintenance Free Earthing system. Methods of testing earth resistance, Different electrode configurations (Plate and Pipe electrode), Tolerable step and touch voltages, Steps involved in design of substation earthing grid as per IEEE standard 80 – 2000.

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UNIT 3

Chapter 3 : Maintenance & Condition Monitoring

3-1 to 3-29

Syllabus : Importance and necessity of maintenance, different maintenance strategies like breakdown maintenance, planned/preventive maintenance and condition based maintenance. Planned and preventive maintenance of transformer, Induction motor and Alternators. Insulation stressing factors, Insulation deterioration, polarization index, dielectric absorption ratio. Concept of condition monitoring of electrical equipments. Advance tools and techniques of condition monitoring, Thermography.

Failure modes of transformer, Condition monitoring of oil as per the IS/IEC standards, Filtration/reconditioning of insulating oil, Condition monitoring of transformer bushings, on load tap changer, dissolved gas analysis, degree of polymerization. Induction motor fault diagnostic methods

– Vibration Signature Analysis, Motor Current Signature Analysis.

Hot Line Maintenance - Meaning and advantages, special types of non-conducting Materials used for tools for hot line maintenance.

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UNIT 5

Chapter 5 : Installation and Estimation of Distribution System 5-1 to 5-34

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UNIT 6

Chapter 6 : Testing and Electrical Safety 6-1 to 6-40

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Contents of first aid box, treatment for cuts, burns and electrical shock. Procedures for first aid (e.g. removing casualty from contact with live wire and administering artificial respiration). Various statutory regulations (Electricity supply regulations, factory acts and Indian electricity rules of Central Electricity Authority (CEA), Classification of hazardous area. (Introduction to OSHA)

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