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Syllabus : (A) The wind power plant – Introduction, wind turbine classes, Wind Turbine Components (Rotor, Nacelle, Tower, Electric Substation, Foundations)

Wind Energy Conversion – Rotation principle, Forces on a rotor blade, Factors affecting performance of rotor (Aerodynamic efficiency, tip speed, tip seep ratio etc.), Thrust and torque on rotor, Power curve. Topologies and operation characteristics of SCIG based wind turbine power plant. Working Principal and operation characteristic of WRIG based wind turbine power plant.

(B) Concentrated Solar Power (CSP) plant Operation and its working, Photovoltaic Conversion – Introduction, Description and principle of working, performance characteristics of a solar cell, types of solar cell, photovoltaic system applications, Stand-alone PV system configurations, Grid-connected PV systems.

Chapter 3 : Electrical Supply Systems 3-1 to 3-25

Syllabus : Electric supply system, Typical ac power supply scheme, Advantages of high transmission voltage, Overhead v/s underground systems, Requirements of a distribution system, Connection schemes of distribution system.

AC Distribution – Methods of solving AC distribution problems, Four wires star connected unbalanced load, Examples.

Chapter 4 : Power Factor and Power Factor Improvement of Load 4-1 to 4-12

Syllabus : Power factor, Power factor triangle, Causes of low power factor, Disadvantages of low power factor, Power factor improvement, Power factor improvement equipment, Calculations of power factor correction, Most economical power factor, Examples.

Chapter 6 : Transmission Line Parameters 6-1 to 6-54

Syllabus : Line resistance, Inductance of single conductor, Inductance of single phase lines, Flux linkages in terms of self and mutual inductances, Inductance of 3-phase transmission lines – Symmetrical spacing, asymmetrical spacing and transposed lines, Inductance of composite conductors, Inductance of 3-phase double circuit lines, Examples.

Line capacitance, Capacitance of single phase lines, Capacitance of three phase lines, Effect of bundling, Capacitance of three phase double circuit lines, Effect of earth on the capacitance, Examples.

Syllabus : Underground cables, construction of cables, Insulating materials of cables, Classification of cables, Cables for 3-phase service, Insulation resistance of a single core cable, Capacitance of a single core cable, Dielectric stress in single core cable, Most economical conductor size in cable, Grading of cables, Capacitance grading, Inter-sheath grading, Capacitance of 3-core cables, Measurement of core to core and core to earth capacitances, Examples.

Syllabus : Classification of substations, Transformer substation, Pole mounted substation, Underground substation, Symbols for equipments in substations, Equipments in a transformer substation, Bus-bar arrangements in substations, Terminal and through substations, Key diagrams of 66/11 kV substation and 11/400 kV indoor substation.

Syllabus : System with ungrounded neutral, Neutral grounding, Advantages of neutral grounding, Methods of neutral grounding – Solid grounding, Resistance grounding, Reactance grounding, Resonant grounding, Voltage transformer earthing, Grounding transformer.

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