Utkalmani Gopabandhu Institute of Engineering, Rourkela-4

Dept of Electrical Engineering

LESSON PLAN

Course Name: GTD (Th4) Semester: 4th

COURSE OBJECTIVES:

After completion of this subject the student will be able to:

- 1. Different schemes of power generation with their block diagram.
- 2. Mechanical and electrical design of transmission lines and numerical problems.
- 3. Types of cables and their methods of laying and testing.
- 4. Different schemes of distribution with problem solving
- 5. Different types of sub-stations.
- 6. Economic aspects of power supply system with problem and type of tariff of electricity.

Chapter 1

Class1. Elementary idea on generation of electricity from Hydel Power Station.

- 2. Elementary idea on generation of electricity from Nuclear Power station.
- 3. Elementary idea on generation of electricity from Thermal Power station.
- 4. Elementary idea on generation of electricity from Solar Power Station.
- 5. Interconnectivity & detail comparison among all power plants.
- 6. Class test & Quiz.

Chapter 2

Class 7. Layout of transmission and distribution scheme.

- 8. Voltage Regulation & efficiency of transmission.
- 9. State and explain Kelvin's law for economical size of conductor.
- 10. Corona and corona loss on transmission lines.
- 11. Class test & Quiz.

Chapter 3

Class 12. Types of supports, size and spacing of conductor.

- 13. Types of conductor materials.
- 14. Types of insulator and cross arms.
- 15. Sag in overhead line with support at same level.
- 16. Problems related sag at same level. (approximate formula effect of wind, ice and temperature on sag)
- 17. Sag in overhead line with support at different level.
- 18. Simple problem on sag at different level.

19. Class test & Quiz.

Chapter 4

Class 20. Calculation of regulation and efficiency for medium (End condensed) TL.

- 21. Problems related to it.
- 22. Calculation of regulation and efficiency for medium (Pi Model) TL.
- 23. Problems related to it.
- 24. Calculation of regulation and efficiency for medium (T model) TL.
- 25. Problems related to it.
- 26. Calculation of regulation and efficiency for medium (End condensed) TL.
- 27. Problems related to it.
- 28. Internal Assessment.

Chapter 5

Class 29. EHV AC transmission.

- 30. Reasons for adoption of EHV AC transmission.
- 31. Problems involved in EHV transmission.
- 32. HV DC transmission & its process.
- 33. Advantages and Limitations of HVDC transmission system.

Chapter 6

Class 34. Introduction to Distribution System.

- 35. Connection Schemes of Distribution System: (Radial, Ring Main and Inter connected system)
- 36. Types of DC distributions. Such as Distributor fed at one End, Distributor fed at both the ends, Ring distributors.
- 37. Problems related to DC Distribution.
- 38. AC distribution system & its type.
- 39. Method of solving AC distribution problem.
- 40. Three phase four wire star connected system arrangement.
- 41. Class test & Quiz.

Chapter 7

Class 42. Cable insulation and classification of cables.

- 43. Types of L. T. & H.T. cables with constructional features.
- 44. Methods of cable lying.
- 45. Localization of cable faults: Murray and Varley loop test for short circuit fault / Earth fault.
- 46. Continue.

Chapter 8

Class 47. Causes of low power factor & problems we face for low pf.

- 48. Methods of improvement of power factor in power system.
- 49. Factors affecting the economics of generation & Load curves.
- 50. Demand factor, Maximum demand, Load factor, Diversity factor.
- 51. Plant capacity factor, Peak load and Base load on power station.
- 52. Revision.

Chapter 9

Class 53. Desirable characteristic of a tariff.

- 54. Explain flat rate, block rate, two part and maximum demand tariff.
- 55. Problems related to this.
- 56. Revision.

Chapter 10

Class 57. Layout of LT, HT and EHT substation.

- 58. Earthing of Substation, transmission and distribution lines.
- 59. Revision & class test.
- 60. Discussion of important Qs.

Learning Materials.

- 1. Principles of Power System, VK Mehta (S Chand Publications)
- 2. Lecture Note.

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