Government Polytechnic, Rajkot

Electrical Engineering Department

Diploma in Electrical Engineering, Semester-3

Course Name: **Electrical Power Transmission & Distribution** Course Code: **DI03000101**

Question Bank

Unit – 1 Elements of overhead transmission lines

CO1: Apply mechanical and electrical design aspects of various types of conductors, support and insulator to maintain overhead line.

Power System Components

1. Classify Transmission System
2. Compare DC transmission system and AC transmission system.
3. Compare overhead system with underground system.
4. State advantages of overhead transmission system.
5. Tabulate commonly used generation, transmission and distribution voltages.
6. State the main elements of transmission line.

Different Effects on Transmission Line

1. Explain skin effect in transmission line.
2. What are the remedies to reduce skin effect?
3. Define Proximity effect.
4. Define bundled conductor.

Line Supports &Insulators

7. What are line supports? Explain various types of line supports.
8. State the properties of conductor material used for transmission line.
9. What is function of stay wire?
10. State desired properties of insulators.
11. Name the materials used for overhead line insulators.
12. State and explain the different types of insulators used in overhead lines.
13. Define string efficiency.
14. State and explain the methods of improving string efficiency.
15. State the reasons for failure of insulator.
16. Calculate sag for a given span, weight, and tensile strength of conductor (with safety factor).
17. Explain the factors affecting sag.
18. Explain the effect of ice coating and wind pressure on sag.
19. What is corona? Write equation of Critical Disruptive voltage and explain in detail.
20. State and explain the factors affecting corona and corona loss.
21. Write the importance of Right of Way in Transmission line.

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Unit – 2 Performance of Transmission Lines

CO2: Analyze performance of transmission line.

1. Draw nominal equivalent T circuit.
2. What is interconnected system?
3. Define voltage regulation of transmission line.
4. What is short transmission line?
5. State four advantages of interconnected grid type distribution system.
6. Derive expression for voltage regulation and efficiency for short transmission line.
7. Explain the function of load dispatch centre.
8. Explain performance of short transmission line with equivalent circuit and vector diagram.
9. Draw and explain the vector diagram for medium transmission line (nominal T or Pi method).
10. Explain the function and necessity of load dispatch centre in the grid system.

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Question Bank

Unit – 3 HVAC and HVDC System

CO3: Illustrate various types of HVDC transmission system.

1. Justify use of Kelvin's law for selection of economical conductor size.
2. Describe in details advantages and disadvantages of HVAC System.
3. Draw block diagram of HVDC Transmission system.
4. List various types of HVDC transmission system.
5. Discuss limitations of HVDC transmission in details.
6. Enlist different components used in HVDC transmission system and discuss working of each component.
7. Write name of various types of FACTS controller.
8. Explain necessity and advantages of FACTS controller.

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Question Bank

Unit – 4 A.C. Distribution System

CO4: Identify basic components of power system distribution.

Power System Distribution

1. Define: i. feeder, ii. Distributor, iii. Service Mains
2. Distinguish between feeder and distributor.
3. State requirements of an ideal distribution system.
4. Give classification of distribution system and explain any one.
5. Illustrate the various methods for feeding distributor.
6. Draw and explain ring busbar system.
7. Derive the expression to calculate sending end voltage and power factor for distributor fed from one end; load power factor should refer to the receiving end voltage.
8. Describe in detail, the consequences of disconnecting neutral in 3-phase, 4-wire AC system.

Cable

1. Explain general construction of a cable.
2. State the properties of insulating materials used for cable.
3. Write a short note on different insulating materials used for cable.
4. State and explain points to be considered for selection of cable size as per IS.
5. Explain SL cable.
6. Describe HSL cable.
7. State the advantages of oil filled cable.
8. State different methos of cable lying.

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Question Bank

Unit – 4 A.C. Distribution System

CO4: Identify basic components of power system distribution.

Numerical

1. A single-phase a.c distributor AB 200 meter long is fed from A loaded as under
   50 A at 0.8 p.f lagging 100 m from point A
   100 A at 0.8 p.f. lagging 200m from point A
   The total resistance and reactance is 0.3 ohm and 0.2 ohm per kilometer respectively. Calculate the total voltage drop in the distributor. The load p.f refers to load voltage.

2. In a two wire distributor ABC, load at C is 100A at 0.8 lagging power factor and load at B is 70A at power factor of 0.9 lagging. Both the power factors are with reference to the receiving end voltage. If the voltage at the receiving end is 400V, Load impedance of section AB is 0.1+j0.2ohm and section BC is 0.2+j0.3 Calculate [1]Voltage at B [2]Total Load current [3]Voltage at A

3. A 1-Φ AC distributor AB is fed from end A and is loaded as shown in below figure. Determine sending end voltage $\overline{V_A}$. The load power factor referred to receiving end (far end) voltage.

4. Draw vector diagram of distributor AC shown in below figure. The load power factor referred to receiving end (far end) voltage.