

[Total No. of Questions - 9] [Total No. of Printed Pages - 2]  
(2064)

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B. Tech 4th Semester Examination

Transmission and Distribution of Electrical Power (O.S.)

EE-4001

Time : 3 Hours

Max. Marks : 100

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** The question paper consists of five section A, B, C, D and E. Section E is compulsory and select one question from each of the sections A, B, C and D.

**SECTION - A**

1. Briefly discuss the equipments installed at substations. (20)
2. A distributor of length 'L' meters has a distributed load of I amp/m. Prove that maximum voltage drop when fed at both ends with equal voltages is one fourth of that when fed at one end. (20)

**SECTION - B**

3. (a) Explain the skin and proximity effects. (10)  
(b) What do you understand by transposition of lines? What are its effects on performance of the line. (10)
4. A 220 kV, 50 Hz three phase transmission line is 50 km long. The resistance per phase is  $0.15 \Omega/\text{km}$ , the inductance per phase is  $1.33 \text{ mH}/\text{km}$  and the shunt capacitance is negligible. Use the short line model to determine.
  - (i) Voltage and power at sending end
  - (ii) Voltage regulation and efficiency when the line is supplying a three phase load of 400 mVA, 220 kV at 0.8 p.f. lagging. (20)

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**SECTION - C**

5. What is a sag template? Explain how this is useful for the location of towers and the stringing of power conductors. (20)
6. What are the advantages and disadvantages of suspension type insulators over pin type insulators? Sketch the sectional view of one unit of the suspension type insulator and describe its construction. (20)

**SECTION - D**

7. Classify underground cables according to various parameters. Give the applications of each type of cable. (20)
8. Describe phenomenon of corona. Explain factors affecting corona and corona loss on high voltage transmission line. (20)

**SECTION - E**

9. Short answer type questions:
  - (i) Why all transmission and distribution systems are 3-phase systems?
  - (ii) What are the advantages of a 3-wire dc distribution system over a two wire dc distribution system?
  - (iii) State the advantages of interconnected power system.
  - (iv) What are the units of constants A, B, C and D of transmission line?
  - (v) Give definition of visual critical voltage.
  - (vi) What is surge impedance loading?
  - (vii) Mention the advantages of PVC over paper insulated cables.
  - (viii) Mention the factors that affect the sag in a transmission line.
  - (ix) What are the causes of insulator failure?
  - (x) What are the types of oil filled cables? (2×10=20)