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16052(D) - 8 DEC 2016

B. Tech 3rd Semester Examination

Transmission and Distribution of Electrical Power (NS)

EE-211

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 : Attempt five questions in all, selecting one question from each sections A, B, C and D. Section E is compulsory.

SECTION - A

1. (a) Differentiate between radial, ring mains and interconnected distribution system. (10)

   (b) Give a typical layout of equipment for 110 kV substation with explanation. (10)

OR

2. Compare various types of ac and dc distribution systems. (20)

SECTION - B

3. (a) Derive and explain the terms characteristic impedance and propagation constant for a long transmission line. (10)

   (b) Derive an expression for inductance of a single phase line having composite conductor. (10)

OR

4. Discuss the various method of voltage control in power system. (20)

SECTION - C

5. (a) Why the voltage distribution across the insulators in an insulator string is not equal? Suggest methods to equalize them. (10)

   (b) Write short technical notes on:

   (i) Effect of ice and wind loading.

   (ii) Vibration and Vibration Dampers. (10)

OR

6. (a) Obtain the expression for sag and tension calculation of a transmission line supported by towers of same height at the end. (10)

   (b) An overhead line has the following data:

   Span length 160 m, conductor diameter 0.95 cm, weight per unit length of the conductor 0.65 kg/m. Ultimate stress 4250 kg/cm^2, wind pressure 40 kg/m^2 of projected area. Factor of safety 5. Calculate the sag. (10)

SECTION - D

7. (a) Explain the inductive interference between power and communication lines. (10)

   (b) A 3-phase, 50 Hz, 132 kV transmission line consists of conductors of 1.17 cm diameter and spaced equilaterally at a distance of 3 meters. The line conductors have smooth surface with value of m=0.96. The barometric pressure is 72 cm of Hg and temperature of 20°C. Determine the fair and foul weather corona loss per km per phase. (10)

OR

8. Derive the expression of capacitance for single core cable and three core cables. (20)

SECTION - E

9. Give answer in short:

(i) What are the advantages of interconnected power system?

(ii) What is ferranti effect?

(iii) What do you mean by transposition of line conductors?

(iv) What are the advantages of bundle conductors?

(v) Write the advantages of per unit system in power system.

(vi) Write the advantages and disadvantages of HVDC transmission lines.

(vii) On what factors does corona loss depends?

(viii) What are the main requirements of sag template?

(ix) Compare the cost of a.c and d.c. overhead lines versus distance.

(x) Deduce the effect of earth on the capacitance of conductor. (2×10=20)