

16052(D) - 0 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/cm², wind pressure 40 kg/m² 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

[P.T.O.]

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)