
B.E./B.Tech DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2014

ELECTRICAL AND ELECTRONICS ENGINEERING

SEMESTER IV – (REGULATIONS 2008)

EE 9251 – TRANSMISSION & DISTRIBUTION

Time: 3 hrs Max Marks: 100

Answer ALL Questions

Part A – (10×2=20)

1. Mention any two advantages of HVDC transmission
2. What is meant by feeder?
3. Define skin effect
4. What do you mean by transposing of conductors?
5. State Ferranti effect
6. Classify transmission line based on their length
7. Discuss the reason for non-uniformity of voltage distribution across the units of insulator strings
8. Draw the cross sectional view of single core cable
9. Write down the advantages of stringing chart
10. What is the expected shape of overhead line when it is strung between two towers?

Part B – (5×16=80)

11. (i) Prove that the voltage drop diagram for a uniformly loaded distributor fed at one end is parabola. Also derive the equation for total power loss in the whole distributor. (8)

    (ii) Calculate the voltage at a distance of 250m of a 350m long distributor uniformly loaded at the rate of 0.8 A/m. The distributor is fed at one end at 250V. The resistance of the distributor (go and return) per metre is 0.00016 Ω. Also find the total power loss in the distributor. (8)

12. a.(i) Show that the inductance per unit length of an overhead line due to internal flux linkages is constant and is independent of size of conductor. (8)

    (ii) A single phase transmission line has two parallel conductors, each of 1.2 cm diameter and 2.5 m apart. Calculate the loop inductance per km length of the line if the material of the conductors is steel with relative permeability of 200. (8)

OR

b. (i) From the fundamentals, derive the expression for capacitance and charging current per km length of a single phase line made up of two solid round conductors of radius r metres and spaced at D meters. Neglect the effect of ground. (8)

(ii) A single phase, 25km long overhead line consists of two conductors 1.8 m apart, diameters of each conductor being 6mm. If the line voltage is 33 kV, 50Hz determine the charging current of the open circuited line. (8)

13. a.Draw the equivalent circuit and phasor diagram of **T** modeled medium transmission line. From this, derive the expressions for sending end voltage and sending end current. (16)

OR

b. Starting from first principles deduce expressions for ABCD constants of a long line in terms of its parameters. Define propagation constant and characteristic impedance. (16).

14.a.(i) Discuss various methods to improve the string efficiency. (8)

(ii) In an insulator string of 3 units, each unit has a capacitance of C. The capacitance between each joint and tower is 0.2C. A grading ring is provided. The capacitance between grading ring and lowest joint is 0.4C. The capacitance between grading ring and second lowest joint is 0.1C. Find string efficiency. (8)

OR

b. (i) Derive the formulae for insulation resistance and capacitance of single core cable. (8)

(ii) Find the most economical size of a single-core cable working on a 132 kV, three phase system, if the dielectric stress of 5kV/mm can be allowed. (8)

15.a. Derive expressions for sag and tension in a power conductor strung between two supports at equal heights taking into account the wind and ice loadings also. (16)

OR

b. Describe the advantages of grounding. Explain in detail about any two methods of neutral grounding. (16)