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

ELECTRICAL AND ELECTRONICS ENGINEERING

SEMESTER IV – (REGULATIONS 2012)

EE 8406 – TRANSMISSION & DISTRIBUTION

Time: 3 hrs Max Marks: 100

Answer ALL Questions

Part A – (10×2=20)

1. How is efficiency of power transmission improved?
2. Distinguish between feeder and distributor
3. Define skin effect
4. Why is transposing of conductors required?
5. State Ferranti effect
6. Define voltage regulation
7. Discuss the reason for non-uniformity of voltage distribution across the units of insulator strings
8. Draw the cross sectional view of three core cable
9. What is meant by tower spotting?
10. Compare AIS and GIS.

Part B – (5×16=80)

11. (i) Explain the requirements of a good distribution system. (8)

    (ii) A distributor PQ is fed from both the ends. At feeding point P the voltage is maintained at 235 V and at Q 236 V. The total length of distributor is 200 m and loads are tapped as under: 20A at 50m from P; 40A at 75m from P, 25A at 100m from P and 30A at 150m from P. The resistance per km of one conductor is 0.4 Ω. Calculate the current in various sections of the distributor, the minimum voltage and point at which it occurs in the system. (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 1.5 cm diameter and 3.0 m apart. Calculate the loop inductance per km length of the line if the material of the conductors is copper. (8)

OR

b. (i) From the fundamentals, derive an expression for the capacitance between conductors of a single phase line. Deduce the expression for line to neutral capacitance. Also write the formula for charging current per phase. (8)

(ii) A single phase, 30km long overhead line consists of two conductors 2.0 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 Π modeled medium transmission line. From this, derive the expressions for sending end voltage and sending end current. (16)

OR

b. Deduce expressions for the sending end and receiving end power of a line in terms of voltages and ABCD constants. Show that the real power transferred is dependent on the power angle and the reactive power transferred is dependent on the voltage drop in the line. (16)

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

(ii)Each conductor of a 33 kV, three phase system is suspended by a string of three similar insulators, the capacitance of each disc is nine times the capacitance to ground. Calculate the voltage across each insulator. Determine the string efficiency also. (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 7kV/mm can be allowed. (8)

15.a. Assuming that the shape of an overhead line can be approximated by a parabola, deduce expressions for calculating sag and conductor length. How can the effect of wind and ice loadings be taken into account? (16)

OR

b. Write short notes on

(i) Solid grounding and resistance grounding (8)

(ii) Explain the function of electrical components in a substation. (8)