SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act,1956)

Course & Branch :B.E - EEE
Title of the Paper :Transmission & Distribution   Max. Marks :80
Sub. Code :414506   Time : 3 Hours
Date :18/11/2009   Session :FN

PART - A   (10 x 2 = 20)
Answer ALL the Questions

1.   Define single line diagram.

2.   State Kelvin's law.

3.   Define GMD.

4.   Mentions the factors on which the corona effect depends.

5.   What is surge impedance loading?

6.   What do you mean by load compensation?

7.   Draw the structure of a typical cable.

8.   Define String Efficiency.

9.   Define BIL.

10. What are arcing horns?

PART – B   (5 x 12 = 60)
Answer ALL the Questions

11. Explain the advantages and disadvantages of HVDC and EHVAC transmission.

(or)

12. Mention the various types of bus bar arrangements. Explain the double bus bar scheme with sectionalisation with the neat sketch. What is the use of bus coupler?

13. (a) Derive the inductance of single phase two wire transmission line.   (4)
    (b) Calculate the inductance/phase of the 3 phase transmission line with conductors A, B, C placed in an equilateral triangle 1 m of its sides. The radius of the conductor is 20mm.   (8)

(or)

14. (a) Explain the phenomena of corona and the conditions affecting corona loss.   (5)
    (b) A 3 phase OH line is being supported by 4 disc insulators. The self capacitance is equal to 10 times the mutual capacitance. Find (i) the voltage distribution across various units expressed as a percentage of total voltage across the string and
        (ii) String efficiency.   (7)

15. A 200km long, 3 phase overhead line has a resistance of 48.7 ohm/phase, inductive reactance of 80.20 ohm/phase and capacitance (line to neutral) 8.42nF/km. It supplies a load of 13.5 MW at a voltage of 132kV and power factor 0.86 lagging. Use rigorous method and hence find the sending end voltage, current, regulation and power angle.

(or)

16. Explain the procedural steps for constructing the receiving end power circle diagram. Also explain how to determine the capacity of phase modifier from the circle diagram.

17. (a) Discuss briefly about the structure of oil filled cable with a neat sketch. (5)

(b) A single core lead sheathed cable is graded by using 3 dielectrics of relative permittivity 5, 4, 3 respectively. The conductor diameter is 2 cm and overall diameter is 8cm. If the 3 dielectrics are worked at the maximum stress of 40 KV/cm, find the safe working voltage of the cable. What will be the safe working voltage for an ungraded cable, assuming the same conductor and overall diameter and the maximum dielectric stress? (7)

(or)

18. An overhead transmission line conductor having parabolic configuration weighs 1.925 kg per meter length, area of cross section 2.2 sq.cm and an ultimate strength of 8000 kg per sq.cm. when erected between supports of 600 m apart and having 15m difference in height. Determine the sag from the taller two supports which must be allowed so that the factors of safety shall be 5; the wire loaded due to 1 kg of ice per meter and no wind pressure.

19. Explain in detail about the lightning phenomena.

(or)

20. Write short notes on:
    (a) Peterson coil
    (b) Surge diverters