**ELECTRICAL AND ELECTRONICS ENGINEERING**

**Sub code: EE2303 Sub Title: Transmission and distribution**

 **Year/Sem:III/V**

**Part A Questions**

**UNIT I**

1.What is an electric power supply system?

2.Name any two FACTS controller devices

3.On what factors does the skin effect depend

4. What is meant by ‘corona’? mention their effects

5. State the disadvantages of HVDC transmission

6.What are the factors affecting sag in the transmission line.

7. list out the advantages of high voltage AC transmission

8. What is meant by stringing chart

9. What is a feeder

10. Differentiate primary distribution and secondary distribution with the help of a diagram.

11. Name some HVDC systems in India

12. What is the level of voltage for HVDC transmission?

13. State the application of HVDC system

14. Define break even distance.

15. What are the different operating voltages used for generation, primary and secondary transmission in AC power supply systems in India?

16. What are different types of power plants.

17. What is the highest voltage level operational in India?

18.What is the function of DVR in a power system

19. what is the compensation provided by SVC

20. Name the Grids operational in India

**UNIT II**

21.Define Skin effect.

22. What is meant by proximity effect?

23. List out the advantages of double circuit lines.

24. Define - Self and mutual – G.M.D.

25. What is meant by inductive interference?

26. What is transposition of conductors

27.What is need of transposition

28.Define the term critical disruptive voltage

29.What are the advantages of using bundled conductors

30.What is bundling of conductors

31. Define unsymmetrical spacing.

32.Why does a transmission lines have resistance, inductance, and capacitance?

33. List the factors that governing the capacitance of a transmission line.

34. What is ACSR conductor?

35. What is fictitious conductor radius?

36. State the advantages of double circuit line over single circuit line.

37. What is Ferranti effect

 38. Define symmetrical spacing.

39.Differentiate the stranded conductor and bundled conductor.

40.What is multi strand conductor and give two advantage of it.

**Part B Questions**

**UNIT I**

1.Compare the HVDC transmission with EHVAC transmission in the following respects

1. Economics of transmission
2. Reliability
3. Technical performance

2.Draw and explain the structure of electrical power system

3.Discuss in detail the various equipments used in HVDC converter station

4.An over head line has a span of 336 m. the line is supported at a water crossing from two towers whose heights are 33.6 m and 29 m above water level. The weight of conductor is 8.33 N/m and tension in the conductor is not to exceed 3.34×104 N. Find

(i) clearance between the lowest point on the conductor and water

(ii) horizontal distance of this point from the lower support.

5. what are the various types of HVDC links? Explain them in detail (10)

Explain the voltage control of HVDC (6)

6. A transmission line conductor at a river crossing is supported from two towers at a height of 50 and 80 m above water level. The horizontal distance between the towers is 300 m. if the tension in the conductor is 2000 kg find the clearance between the conductor and water at a point midway between the towers. Weight of conductor/m = 0.844 kg. Derive the formula used.

7. a)Derive expressions for sag and tension in a power conductor strung between to supports at equal heights taking into account the wind and ice loading also.(8)

b)An overhead line has a span of 300m. The conductor diameter is 1.953 cm and the conductor weight is 0.844 kg/m. calculate the vertical sag when a wind pressure is 736 N/sq.m of projected area acts on conductor. The breaking strength of conductor is 77990 N and the conductor should not exceed half the breaking strength.

8. a)Compare power transmission using over head line and under ground cable. (8)

 b) Draw a simple model of UPFC ? . (8)

9.Explain the detail types of FACTS controllers

10. a)Derive expressions for sag in a power conductor strung between to supports at unequal heights(8)

b) write short notes on SVC

**UNIT II**

11.Calculate the loop inductance/km of single phase line comprisisng of two parallel conductors 1m apart and 1cm in diameter,when the material of conductor is

1. Copper
2. Steel of relative permeability 50

12.Derive the equation for capacitance of 3 phase unsymmetrically spaced overhead lines.

13. Derive the equation for inductance of 3 phase unsymmetrically spaced overhead lines.

14. A 220kV 50Hz 200 km long three phase line has its conductors on the corners of a triangle with sides 6 m, 6 m and 12 m. the conductor radius is 1.81 cm. Find the capacitance/km capacitive reactance/phase, charging current and total charging Mvar.

15. Find the inductance /phase /km of doublecircuit 3phase line shown in fig. the line is completely

Transposed and operates at a frequency of 50Hz. Radius r = 6mm

5 m

c’

a

3 m

6 m

b’

b

3 m

a’

c

5 m

16.Derive the expression for the voltage induced in communication lines due to the current in power lines.(8)

Explain the various factors affecting the corona loss.(8)

17. Derive an expression for capacitances of a single phase transmission system and discuss the effect of earth on capacitance with suitable equation.

18a) Derive an expression for the capacitance between conductors of a single phase overhead line.

 b) Find the capacitance between the conductors of a single-phase 10 km long line. The diameter of each conductor is 1.213cm. The spacing between conductors is 1.25m. Also find the capacitance of each conductor neutral. **(8)**

19. a) Derive the expression for the capacitance per phase of the 3 Φ double circuit line flat vertical spacing with transposition. **(8)**

 b) A 3 Φ overhead transmission line has its conductors arranged at the corners of an equilateral triangle of 2m side. Calculate the capacitance of each line conductor per km. Given the diameter of each conductor is 1.25cm. **(8)**

20. Find the capacitance per km per phase of a 3Φ line arrangement in a horizontal plane spaced 8 metres apart. The height of all conductors above the earth is 13 metres. The diameter of each conductor is 2.6 cm. the line is completely transposed and takes the effect of ground into account. **(16)**