A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 94304

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Fourth Semester

Electrical and Electronics Engineering

19UEE404- TRANSMISSION AND DISTRIBUTION

(Regulation 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following voltage is the usually not secondary distribution voltage in Tamilnadu? CO1- U

   (a) 400 V (b) 440 V (c) 115 V (d) 230 V

2. Which of the following system is one way power transfer system CO1- U

   (a) Radial system (b) Ring main system

   (c) Interconnected system (d) None of the above

3. GMR of a conductor is CO2- U

   (a) GMR = 0.7788 r (b) GMR = 0.7677 r (c) GMR = 0.7766 d (d) GMR = 0.7788 d

4. Skin effect is not associated with the following one CO2- U

   (a) Frequency (b) Diameter of the wire (c) Shape of the wire (d) Size of the wire

5. What is the distance covered for short transmission line CO3- U

   (a) Less than 50 km (b) More than 50 km (c) 50 km to 150 km (d) Less than 60 km

6. Surge impedance of the transmission line is ? CO3- U

   (a) Root of L / C (b) Root of R / C (c) Root of L / R (d) root of L / C*R

7. What is the forbidden level of Insulator ? CO4- U

   (a) Less than 3 eV (b) 0.7 eV (c) 0.3 eV (d) More than 4 eV

8. What is the maximum voltage per insulator is? CO4- U

(a) 22 KV (b) 33 KV (c) 11 KV (d) 66 KV

9. Sag the conductor takes the following form CO5- U

(a) $S = W L^2 / 2 T$ (b) $W L / 8 D$ (c) $W L^2 / 8 T$ (d) $W L^2 / 8 D$

10. Outdoor substation is preferred for CO5- U

(a) Less than 66 KV (b) Beyond 110 KV (c) Less than 110 KV (d) Beyond 66 KV

PART – B (5 x 2= 10 Marks)

11. What are the types of HVDC links? CO1- U

12. What is the need of Transposition? CO2- U

13. What is Ferranti effect? CO3- U

14. Draw the equivalent circuit of a cable? CO4- U

15. What is Substation? CO5- U

PART – C (5 x 16= 80 Marks)

16. (a) Example with a neat layout of the modern EHV system ? What is the highest voltage level available in Tamilnadu and India for EHV transmission system? CO1- U (16)

Or

(b) A 2 wire DC distributor AB is 300 metres long. It is fed at point A . The various loads and their positions are given below. CO1- U (16)

At point	Distance from A in metres	Concentrated load in amperes
C	40	30
D	100	40
E	150	100
F	250	50

If the maximum permissible voltage drop is not to exceed 10 V , find the cross sectional area of the distributor. Take $\rho = 1.78 \times 10^{-8}$ Ω metres.

17. (a) A single phase 10 km line is 8 m above the ground. The diameter of the conductor is 2 cm and is separated by 4 km horizontally. Find CO2- U (16)

(i) Capacitance between conductors

(ii) Capacitance between phase and neutral plane

(iii) Capacitance when effect of ground is neglected.

Or

(b) (i) Derive an expression for Inductance of a 3 phase transmission line with unsymmetrical spacing. CO2- U (8)

(ii) Explain the concept of Transposition of conductor CO2- U (8)

18. (a) A single phase 11 KV line with a length of 15 km is to transmit a power of 500 KVA. The inductance reactance of the line is 0.5 ohm / km and the resistance is 0.3 ohm / km. Calculate the CO3- U (16)

(i) Efficiency and

(ii) Regulation of the line for 0.8 lagging power factor.

Or

(b) Explain the following methods for Medium Transmission lines CO3- U (8)

(i) End Condenser method

(ii) Nominal T method (or) middle condenser method CO3- U (8)

19. (a) A suspension string has 3 units. Each unit can withstand a maximum voltage of 11 KV. The capacitance of each joint and metal work is 20 percent of the capacitance of each disc. Find CO4- U (16)

(i) Maximum line voltage for which the string can be used and

(ii) String efficiency

Or

(b) Discuss briefly on the following Insulator: CO4- U (4)

(i) Pin Insulator

(ii) Suspension Insulator CO4- U (6)

(iii) Strain Insulator CO4- U (6)

20. (a) Make a short note on the following topics:

(i) Indoor substation	CO5- U	(8)
(ii) Outdoor substation	CO5- U	(8)

Or

(b) Explain the following concepts with the help of diagram.

(i) Peterson coil grounding	CO5- U	(8)
(ii) Reactance grounding	CO5- U	(8)