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

Question Paper Code: 94304

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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 is usually not the generating voltage ? CO1- R

   (a) 6.6 kV (b) 9.9 kV (c) 11kV (d) 13.2 kV.

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

   (a) Radial system (b) Ring main system

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

3. GMR of a conductor is CO2- R

   (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- R

   (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- R

   (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- R

   (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- R

   (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- R

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

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

(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- R

(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. Why all transmission and distribution systems are 3 phase systems? CO1- R

12. Define proximity effect. CO2- R

13. Define Ferranti effect. CO3- R

14. Why are insulators used withoverhead lines? CO4- R

15. What is the reason for the sag in the transmission line? CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Draw and explain the basic structure of the power system with relevant voltage levels. 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 $\rho = 1.78 \text{ X } 10^{-8}$ Ω metres.

17. (a) Derive an expression for capacitances of three phase un-symmetrically spaced transmission lines. CO2- U (16)

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 (i) Efficiency and (ii) Regulation of the line for 0.8 lagging power factor.	CO3- U	(16)
		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)	Explain the methods of grading of cables with neat diagrams and equations.	CO4- U	(16)
		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)	Derive the expressions for sag and conductor length under bad weather conditions. Assume Shape of overhead line is a parabola.	CO5- U	(16)

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