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

Question Paper Code: 54304

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Fourth Semester

Electrical and Electronics Engineering

15UEE404- TRANSMISSION AND DISTRIBUTION

(Regulation 2015)

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- R

   (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- 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. What are the types of HVDC links? CO1- R

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

13. What is Ferranti effect? CO3- R

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

15. What is Substation? CO5- R

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. CO2- U (16)

Find

(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 (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)	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 (i) Maximum line voltage for which the string can be used and (ii) String efficiency	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) Explain the following concepts with the help of diagram.

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