Reg. No. : | | | | | | | | | | |

Question Paper Code: 44303

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Fourth Semester

Electrical and Electronics Engineering

14UEE403 - TRANSMISSION AND DISTRIBUTION

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. A bus bar is rated by

   (a) Current and voltage only (b) Current only
   (c) Frequency only (d) Current and voltage and frequency

2. Size of the conductor in the distribution system is found out using

   (a) Ohm's law (b) Kirchhoff's law
   (c) Kelvin's law (d) Faraday's law

3. Overhead lines generally use

   (a) Copper conductors (b) All aluminum conductors
   (c) ACSR conductors (d) None of these

4. Corona occurs between two transmission wires when they

   (a) Are closely spaced (b) Are widely spaced
   (c) Have high potential difference (d) Carry dc power

5. If the power factor of the load decreases, the line losses

   (a) Increases (b) Decreases
   (c) No change (d) Initially increases then decreases

6. In the analysis which of the following lines shunts capacitance is neglected?

(a) Short transmission lines (b) medium transmission
(c) long transmission (d) medium and long transmission

7. The power factor of industrial loads is generally

(a) unity (b) Lagging (c) Leading (d) Zero

8. Transmission line insulators are made of

(a) Glass (b) Porcelain (c) iron (d) PVC

9. The knowledge of maximum sag is essential in determining the

(a) Ground clearance of the conductor (b) Maximum span of the conductor
(c) Maximum stress on the conductor (d) Load capacity of line

10. Grounding of system and equipment is essential for the

(a) Safe operation (b) Decrease of fault current
(c) Increase of efficiency (d) None of the above

PART - B (5 x 2 = 10 Marks)

11. Distinguish between feeder and distributor.

12. What is meant by transposition in overhead transmission line?

13. Define transmission efficiency.

14. Name the methods by which the string efficiency can be improved.

15. Define sag in power systems.

PART - C (5 x 16 = 80 Marks)

16. (a) Draw and explain the structure of electric power systems indicating the voltage level in each transmission levels. (16)

Or

(b) Explain with neat diagram about STATCOM and UPFC. (16)

17. (a) Derive the expression for capacitances of single phase transmission system and discuss the effect of earth on capacitance with suitable equation. (16)

Or

(b) Determine the corona characteristics of a 3 phase line 160 *km* long, conductor diameter 1.036 *cm*, 2.44 *m* delta spacing, air temperature 26.67^{o}, altitude 2440 *m* corresponding to an barometric pressure of 73.15 *cm*, operating voltage is 110 *kV* at 50 *HZ*. (16)

18. (a) Derive the expression for sending end voltage in nominal T method. (16)

Or

(b) Compute the sending end voltage, current and power factor of a 1 phase, 50 *Hz*, 76.2 *kV* transmission line delivering a load of 12 *MW* at 0.8 *pf lag*. The line constant are $R = 25\ \Omega$, $L = 20$ *mH* and capacitance between lines is 2.5 μF. Also find the efficiency and regulation of transmission. Use nominal π method. (16)

19. (a) Discuss any two methods to increase the value of string efficiency with suitable sketches. (16)

Or

(b) (i) Why are insulator used with overhead lines? Discuss the desirable properties of insulator. (8)

(ii) A suspension type insulator is having 4 units and the value of pin-to-earth capacitance is C. If the capacitance of top unit is 6C, find the capacitance of each unit to make the string efficiency 100 %. (8)

20. (a) A transmission line conductor having a diameter of 19.5 *mm* weights 0.85 *Kg/m*. The span is 275 *meters*. The wind pressure is 39 *kg/m*^{2} of projected area with ice coating of 13 *mm*. The ultimate strength of the conductor is 8000 *kg*. Calculate the maximum sag if the safety factor is 2 and the ice weighs 910 *kg/m*^{3}. (16)

Or

(b) (i) Derive the expression for sag and tension in a power conductor string between two support at equal heights. (8)

(ii) A transmission line has a span of 200 meters between level supports. The conductor has a cross-sectional area of 1.29 *cm*^{2}, weighs 1170*kg/km* and has a breaking stress of 4218 *kg/cm*^{2}. Calculate the sag for a safety factor of 5, allowing a wind pressure of 122 *kg/square metre* of projected area. What is the vertical sag? (8)

44303