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

Question Paper Code: 44303

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

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. In transmission system a feeder feeds power to

   (a) Service mains (b) Generating stations
   (c) Distributors (d) All the above

2. Which of the following distribution system is more reliable?

   (a) Radial (b) Ring main
   (c) Tree (d) All are equally reliable

3. The rated voltage of a three phase power system is given as

   (a) RMS phase voltage (b) RMS line to line voltage
   (c) Peak line to line voltage (d) Peak phase voltage

4. The charging current in a transmission line increases due to corona effect because corona increases

   (a) Line current (b) Effective line voltage
   (c) Power loss in lines (d) Effective conductor diameter

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. The square root of the ratio of line impedance and shunt admittance is called

(a) Surge impedance of the line (b) Conductance of the line
(c) Regulation of the line (d) None of these

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. If the tension in the overhead line is doubled, then the sag is

(a) Doubled (b) Halved
(c) Increased three times (d) Load None of these

10. Most of the substations in the power system change _____of electric supply.

(a) Current level (b) Voltage level
(c) Both (a) and (b) (d) None of these

PART - B (5 x 2 = 10 Marks)

11. List out the various devices used in FACTS.

12. Define skin effect.

13. Define transmission efficiency.

14. What is meant by dielectric stress in a cable?

15. Define sag in power systems.

PART - C (5 x 16 = 80 Marks)

16. (a) Illustrate the structure of power system indicating the different voltage level. (16)

Or

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

17. (a) (i) Derive an expression for the inductance of a single phase overhead line. (8)

(ii) Derive an expression for the capacitance of a three phase overhead line equilateral spacing. (8)

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) (i) Show how regulation and efficiency are determined for medium lines using nominal Pi method. (10)

(ii) Determine the ABCD constants for a short transmission line. (6)

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 Ω, 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) Explain various methods of grading of cables with necessary diagram. (16)

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) A transmission line has a span of 150m between level supports. The conductor has a cross sectional area of 2 cm$^{2.}$ The tension in the conductor is 2000 Kg. If the specific gravity of the conductor material is 9.9 gm/cm^{3} and wind pressure is 1.5 kg/m length, Calculate the sag. What is the Vertical Sag? (16)

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