Reg. No. :

<div style="text-align:center">

Question Paper Code: 44303

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Fourth Semester

Electrical and Electronics Engineering

14UEE403 - TRANSMISSION AND DISTRIBUTION

(Regulation 2014)

</div>

Duration: Three hours   Maximum: 100 Marks

<div style="text-align:center">

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

</div>

1. In a three wire system, the area of cross section of neutral is generally _____ of either outer.

    (a) Double   (b) Same   (c) Half   (d) None of these

2. If Power P available from a hydro scheme is given by the formula $P = 9.81QH$, where Q is the flow rate through the turbine in l/s and H is the head in metres, then P will be in units of

    (a) HP   (b) W   (c) KJ/s   (d) kWh

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. In a substation the following equipment is not installed

    (a) Exciters   (b) Series capacitors

    (c) shunt reactors   (d) Voltage Transformers

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

<div align="center">PART - B (5 x 2 = 10 Marks)</div>

11. How does AC distribution calculations differ from DC distribution?

12. Why skin effect is absent in DC system?

13. Define voltage regulation of a transmission line.

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

15. Define sag in power systems.

<div align="center">PART - C (5 x 16 = 80 Marks)</div>

16. (a) Draw a schematic layout of a typical AC power supply scheme and explain the operation of various components involved in the system.   (16)

<div align="center">Or</div>

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

44303

17. (a) Derive the capacitance of three phase line unsymmetrically transposed. (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°, altitude 2440 *m* corresponding to an barometric pressure of 73.15 *cm*, operating voltage is 110 *kV* at 50 *HZ*. (16)

18. (a) Draw the equivalent circuit of a short transmission line and derive the expression for regulation and efficiency. (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) A string of eight suspension insulators is to be fitted with a guard ring. If the pins to earth capacitance are all equal to *C*, find the values of line to pin capacitance that would give uniform voltage distribution over the string. (16)

Or

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

20. (a) (i) Deduce an approximate expression for sag in overhead lines when supports are at equal levels. (10)

(ii) Classify the various types of substations according to service requirements. (6)

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)

——————

44303

44303