Register Number: ……

B.E. DEGREE EXAMINATIONS: NOV / DEC 2010

Fifth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U07EE502: Transmission and Distribution

Time: Three Hours **Maximum Marks: 100**

Answer All the Questions

PART A (10 x 1 = 10 Marks)

1. Increase in the transmission voltage _____ the conductor material required

   A. Increase B. Decrease C. maintains D. Increase or Decrease

2. Primary transmission is done by_____

   A. 3 phase 2 wire system B. 3 phase 3 wire system

   C. 3 phase 4 wire system D. 1 phase 2 wire system

3. The generalized constants A and D of the transmission line have _____

   A. Dimensions of Ohm B. Dimensions of mho

   C. No dimensions D. Ohm and mho respectively

4. $30\angle 10^o \times 60\angle 20^o$ _____

   A. $2\angle 2^o$ B. $1800\angle 30^o$ C. $1800\angle 2^o$ D. $90\angle 30^o$

5. The insulator is so designed that it should fail only by _____

   A. Falsh-over B. Puncture C. Sag D. A & B

6. For operating voltages beyond 66 KV, _____ cables are used.

   A. Belted B. S.L. type C. oil-filled D. H type cable

7. Underground substations are generally located in _____

   A.Thickly populated areas B. Villages C. Anywhere D. Remote areas

8. A bus bar is rated by

   A. Current and voltage only B. Current only

   C. Current, voltage and frequency D. Any one of above

9. Reactive power to HVDC system may be supplied from

   A. AC filters B. Shunt capacitors C. SVS D. All above

10. For a given power delivered, if the working voltage of a distributor line is increased to *m* times, the cross sectional area *a* of distributor line would be reduced to

    A. $(1/m^2)a$ B. $(1/m)a$ C. $(1/2m)a$ D.m/a

PART B (10 x 2 = 20 Marks)

11. What is skin effect?
12. What are the transmission level voltages available in India?
13. How the transmission lines are classified?
14. What is Ferranti effect?
15. What are the different types of insulators?
16. What is grading of cable.
17. What is single Bus Scheme?
18. What is distribution substation?
19. Explain Radial system, Ring main system and interconnectors.
20. What is a service main?

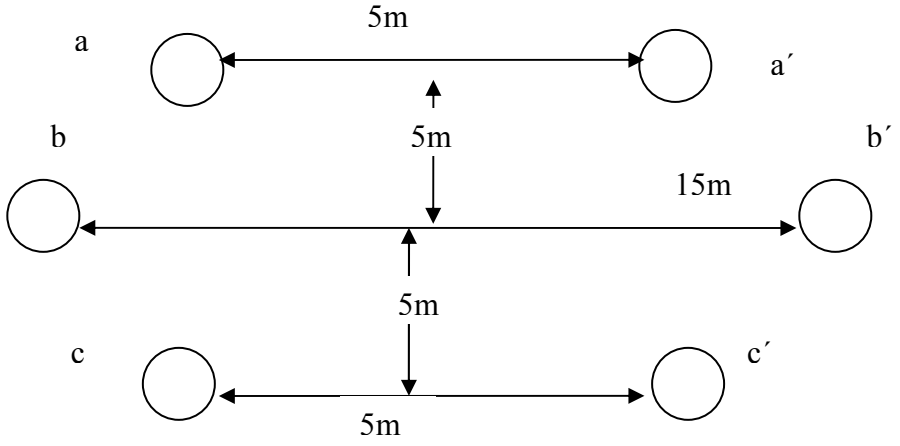
PART C (5 x 14 = 70 Marks)

21. a) (i) Derive from first principles the inductance of a single phase line. (7)

(ii) Derive from first principles the capacitance of a single phase line. (7)

[OR]

b) Three phase double circuit line as given below has conductor radius of 5cm. Find the inductance per km/phase. Spacing shown is centre to centre distance



22. a) Using nominal T-method determine the regulation and efficiency of a 3 phase 50 Hz transmission line delivering balanced load of 24 MW at 0.8 power factor lagging and receiving end voltage of 66 KV. Resistance, inductance and capacitance per phase are 9.6 ohms, 0.997 H and 0.765 μF respectively

[OR]

b) Using nominal π-method determine the voltage, current and power factor of a 3 phase 50 Hz transmission line delivering balanced load of 100 MVA at 0.8 power factor lagging and with receiving end voltage of 132 KV. Resistance, inductance and capacitance per phase per km are 0.16 ohms, 1.2 mH and 0.0082 μF

23. a) (i) Compare the overhead lines with underground cables. (7)

(ii) Discuss about the construction of a underground cable with neat diagram. Also give the different types of cables. (7)

[OR]

b) (i) In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self capacitance of each insulator, find i) the distribution of voltage over 3 insulators and ii) string efficiency.(7)

(ii) Give the methods of improving String efficiency. (7)

24. a) Explain the types of substations with neat diagram.

[OR]

b) Explain the design principles of substation grounding.

25. a) A two-core cable is 300m long, the total resistance (go and return) being 0.75Ω. The cable is uniformly loaded with 2 A/m. Calculate the point of minimum potential and value of this potential when the distributor is fed from both ends at 200 V.

[OR]

b) (i) Explain the advantages and disadvantages of HVDC systems. (7)

(ii) Explain in detail, the applications of HVDC system. (7)

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