ONE TIME EXIT SCHEME

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10EE53

Fifth Semester B.E. Degree Examination, April 2018
Transmission and Distribution

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.

PART – A

1 a. Draw and explain the line diagram of a typical transmission and distribution scheme. Indicate clearly the voltage levels used at different stages. **(05 Marks)**

b. State the advantages of high voltage transmission. **(05 Marks)**

c. Explain the following components of distribution:
i) Substation ii) Distribution substation iii) Feeder
iv) Distribution v) Service mains. **(10 Marks)**

2 a. Derive an expression for a sag in a power conductor string between two supports at equal heights taking the effect of wind and ice coating. **(10 Marks)**

b. The towers of height 30 m and 90 m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 560 m. the ultimate strength of the conductor is 6400 kg. Find the minimum clearance of the conductor and water and clearance midway between the supports. Weight of the conductor is 1.5 kg/m. Bases of towers can be considered to be at water level. Factor of safety may be taken as 4. **(10 Marks)**

3 a. List the different types of insulators used in transmission and distribution system and hence explain different types of testing of insulators. **(10 Marks)**

b. What are the possible methods to improve the string efficiency of an insulator string and explain? **(10 Marks)**

4 a. List out the advantages and disadvantages of corona. **(05 Marks)**

b. What is critical disruptive voltage? State its significance. **(05 Marks)**

c. What is meant by grading of a cable? Explain the various methods of grading of cables. **(10 Marks)**

PART – B

5 a. Derive the expression for capacitance of a 3 phase line with unsymmetrical horizontal spacing. **(10 Marks)**

b. A 3 phase, 50 Hz, 66 KV overhead line conductors are placed in a horizontal plane as shown in the Fig.Q5(b).

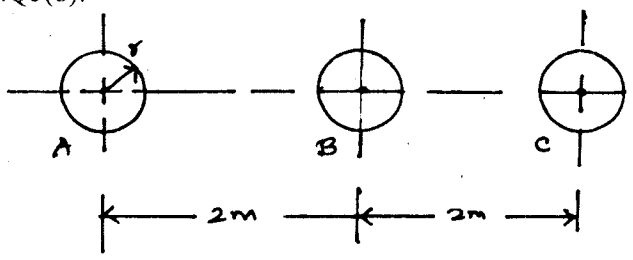

Fig.Q5(b)

The conductor diameter is 1.25 cm. If the line length is 100 km, calculate: (i) Capacitance/phase, (ii) Charging current/phase, assuming complete transposition of the line. **(10 Marks)**

6 a. What is skin effect? On which factors it depends? **(05 Marks)**

b. What do you mean by self GMD and mutual GMD? **(05 Marks)**

c. Calculate the inductance of each conductor in a 3 phase 3 wire system. Conductors ar arranged in a horizontal plane with spacing $d_{31} = 4m$, $d_{12} = d_{23} = 2m$. The conductors ar transposed and have a diameter of 2.5 cm. **(10 Marks)**

7 a. Write short note on classification of transmission lines. **(05 Marks)**

b. Write a short note on Ferranti effect. **(05 Marks)**

c. A 3 phase 50 Hz overhead transmission line has the following constants per phase R = 28 Ω x = 63 Ω, y = 4×10^{-4} (℧). If the load at the receiving end is 75 MVA at 0.8 pf lag wit 132 KV between lines, calculate the voltage, current and p.f. at the sending end. Us nominal π method. **(10 Marks)**

8 a. What is meant by DC distribution? What are the types of different distribution? Give prop figure for each of them. **(05 Marks)**

b. A two wire d.c. distribution system 3 km long and it supplies loads of 200 A, 100 A, 75 and 50 A at 800 mt, 1200 mt, 2000 mt and 3000 mt from the feeding point A. Eac conductor has go and return resistance of 0.004 ohms per 100 mts. Calculate the voltage each load point if the voltage at the feeding end is 240 V. **(10 Marks)**

c. Explain Ring main distributer with inter connector. **(05 Marks)**

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