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Question Paper Code : 57317

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Fourth Semester

Electrical and Electronics Engineering

EE 6402 – TRANSMISSION AND DISTRIBUTION

(Regulations 2013)

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

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What are the advantages of high voltage power transmission ?
2. What are the objectives of FACTS ?
3. Define transposition of lines.
4. What is corona ?
5. Define Ferranti effect.
6. Mention the significance of surge impedance loading.
7. What are the tests performed on the insulators ?
8. Classify the cables used for three phase service.
9. Define sag.
10. What is meant by stringing chart ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Explain the structure of electric power system. **(8)**

(ii) A two wire dc ring main distributor ABCDEA is fed at point A with 230V supply. The resistances of go and return conductors of each section AB, BC, CD, DE, AE are 0.1 ohm. The main supplies the loads of 10A at B, 20A at C, 10A at D, 30A at E. Find the voltage at each load point. **(8)**

OR

(b) (i) Explain the different types of FACTS controllers. **(8)**

(ii) Explain the different HVDC links. **(8)**

12. (a) Derive the expression for the capacitance of a three phase transmission line with unsymmetrical spacing. **(16)**

OR

(b) Determine the inductance per km of a double circuit 3Φ line as shown in Fig. Q. 12 (b). The transmission line is transposed within each circuit and each circuit remains on its own side. The diameter of each conductor is 15mm. **(16)**

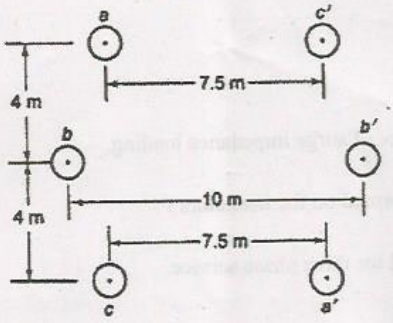

Fig. Q. 12 (b)

13. (a) A 3Φ, 50Hz, 100 km line has the following constants. Resistance/phase/ km = 0.153 ohm, inductance/phase /km = 1.21mH, capacitance/phase / km = 0.00958 μF. If the line supplies a load of 20MW at 0.9 pf lagging at 110 kV at the receiving end calculate sending end current, sending end power factor, regulation and transmission efficiency using nominal T method. **(16)**

OR

(b) The constants of a three phase line are A = 0.9∟2° and B = 140∟70° ohms per phase. The line delivers 60 MVA at 132 kV and 0.8 pf lagging. Draw power circle diagrams and find (a) sending end voltage and power angle (b) the maximum power which the line can deliver with the above values of sending and receiving end voltages (c) the sending end power and power factor (d) line losses. **(16)**

14. (a) (i) Briefly explain the different methods to improve string efficiency of suspension type insulators. **(8)**

(ii) A three unit insulator string is fitted with a guard ring. The capacitances of the link pins to metal work and guard ring can be assumed to be a 15% and 5% of the capacitance of each unit. Determine voltage distribution and string efficiency. **(8)**

OR

(b) Explain the methods of grading of cables with neat diagrams and equations. **(16)**

15. (a) A transmission line has a span of 275 m betweeen level supports. The conductor has an effective diameter of 1.96 cm and weighs 0.865 kg/m. If the conductor has ice coating of radial thickness 1.27 cm and is subjected to a wind pressure of 3.9 gm/sq.cm of projected area. The ultimate strength of the conductor is 8060 kg.Calculate the sag if the factor of safety is 2 and weight of 1 c.c of ice is 0.91 gm. **(16)**

OR

(b) Explain the methods of neutral grounding. **(16)**
