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B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

11 . 5 . 13

Fifth Semester

Electrical and Electronics Engineering

080280040 — TRANSMISSION AND DISTRIBUTION

(Regulation 2008)

Time : Three hours   Maximum : 100 marks

(Codes/ Tables/ Charts to be permitted, if any, may be indicated)

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What are the advantages of steam power plant?

2.   What are the three main factors for power output of hydroelectrjc plant?

3.   Define self and mutual G.M.D.

4.   Define unsymmetrical spacing.

5.   What is tuned power line?

6.   What is the use of power circle diagram?

7.   List out various types of insulators used for overhead transmission lines.

8.   What are the methods for improving string efficiency?

9.   List the various types of distribution systems.

10. What are the advantages of UPFC?

PART B — (5 × 16 = 80 marks)

11. (a)   Explain the construction and working of Steam power plant with a
          layout.   (16)

                                    Or

     (b)   Explain the Solar thermal central receiver system.   (16)

12. (a) Derive an expression for capacitances of a single phase transmission system and discuss the effect of earth on capacitance with suitable equation. (16)

Or

(b) Find the capacitance per km per phase of a 3Φ line arrangement in a horizontal plane spaced 8 metres apart. The height of all conductors above the earth is 13 metres. The diameter of each conductor is 2.6 cm. the line is completely transposed and takes the effect of ground into account. (16)

13. (a) A 220kv, 3Φ transmission line has an impedance per phase of $(40 + j200)\,\Omega$ and an admittance of $(0 + j0.0015)$ mho. Determine the sending end voltage and sending end current when the receiving end current is 200 A at 0.95 pf lagging. Use nominal T method. (16)

Or

(b) Determine the efficiency and regulation of a three phase 200 km, 50Hz transmission line delivering 100MW at a pf of 0.8 lagging and 33kV to a balanced load. The conductors are of copper, each having resistance 0.1 Ω/km, and 1.5cm outside dia, spaced equilaterally 2m between centres. Neglect leakage reactance and use nominal T and it methods.(16)

14. (a) Explain any two methods of grading of cables with necessary diagrams. (16)

Or

(b) (i) Describe with the neat sketch, the construction of a 3 core belted type cable. (8)

(ii) A conductor of 1cm diameter passes centrally through porcelain cylinder of internal diameter 2 cms and external diameter 7cms. The cylinder is surrounded by a tightly fitting metal sheath, The permittivity of porcelain is 5 and the peak voltage gradient in air must not exceed 34kV/cm. Determine the maximum safe working voltage. (8)

15. (a) (i) Explain the effect of high voltage on volume of copper and on efficiency. (8)

(ii) Explain why the transmission lines are 3 phase 3-wire circuits while distribution lines are 3 phase 4-wire circuits. (8)

Or

(b) Explain TCSC and SVS systems. (16)

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