D 12048 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) [14 SCHEME] DEGREE EXAMINATION, NOVEMBER 2016

EE 14 502—ELECTRICAL POWER GENERATION, TRANSMISSION AND DISTRIBUTION

Time : Three Hours Maximum : 100 Marks

Part A

Answer **eight** *questions out of ten questions.*

1. Explain the working of a geothermal plant.
2. Distinguish between the conventional and unconventional energy sources.
3. Give a comparison between over head system and underground system.
4. Explain the use of guard rings and arcing horns on suspension insulator.
5. Explain the need of grading of cables.
6. State the main types of distribution systems used and compare their application.
7. Distinguish between radial and ring mains.
8. Write the advantages and Disadvantages of AC and DC Transmission Systems.
9. Discuss the R, L and C parameters of Transmission lines.
10. Explain the Inductance of Composite conductors.

(8 × 5 = 40 marks)

Part B

Answer **all** *questions.*

11. Explain the different classification of hydro power plant. (15 marks)

Or

12. (a) Write short notes on :

    (i) Economics of power factor improvement.

    (ii) Capacity of phase advancing plant.

    (iii) Demand factor, load factor.

(15 marks)

13. (a) Describe the composite conductors and discuss their advantages. (8 marks)

    (b) Discuss the advantages and disadvantages of high voltage transmission. (7 marks)

Or

14. (a) A string insulator units have self capacitance equal to 15 times the pin to earth capacitance.

(i) Voltage distribution from top to bottom insulator as a percentage of the total voltage.

(ii) The string efficiency.

(10 marks)

(b) Derive the expression for the electrostatic stress in a single core cable. (5 marks)

15. A three phase overhead transmission line is being supported by three discs of suspension insulators. The potentials across the first and second insulators are 8 kV and 11 kV respectively. Calculate :

(a) The ratio of capacitance between pin and earth to self capacitance of each unit.

(b) The string efficiency.

(15 marks)

Or

16. (a) List down the necessary requirements of a power distribution system. (7 marks)

(b) Explain the radial and ring main distribution system, bring out their merits and demerits.

(8 marks)

17. (a) Explain briefly, the self GMD and the mutual GMD. (8 marks)

(b) A Single phase transmission line has two parallel conductors, each of 1.2 cm. diameter, and 2.5 m. apart. Calculate the Loop inductance per km. length of the line, if the material of the conductors is :

(i) Copper.

(ii) Steel with relative permeability of 200.

(7 marks)

Or

18. (a) Derive an expression for the loop inductance of a single phase, two wire (solid) stems from the fundamental.

(8 marks)

(b) A Three phase, 132 KV, 50 Hz overhead transmission line has steel cored aluminium conductors of equivalent copper area of 1.5 cm^2. and an effective diameter of 39.2 mm. spaced equilaterally 8 m. apart. Calculate the line constants per km. length of the line. The resistivity of the copper is 1.73 $\mu\Omega$ cm.

(7 marks)

[4 × 15 = 60 marks]