Roll No…….. **Total No. of Printed Pages: 1**

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B. Tech EE (Semester – 5th)

POWER SYSTEMS-I (TRANSMISSION & DISTRIBUTION)

Subject Code: BELES1501

Paper ID: 18111521

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

a. What are micro grids write two salient features of micro grids.

b. Define voltage regulation in transmission system.

c. Why transmission systems are mostly overhead systems.

d. What is stringing of conductors in mechanical design of conductors?

e. Define surge impedance loading.

f. Why overhead line conductors are invariably stranded?

g. What is insulation resistance in cables?

h. What is the string efficiency? Define its significance in power network.

i. What is the role of transposed conductors in transmission system?

j. Distinguish between feeder and distributor.

Section – B **(5 marks each)**

Q2. Find the A,B,C,D parameters of a 3-phase, 100 km, 50 Hz transmission line with series impedance of (0.15 +j0.78) ohm per km and a shunt admittance of j5.0x 10^{-6} mho per km.

Q3. A three phase overhead transmission line is being supported by three disc suspensions insulators. The potential across first and second insulator are 8kV and 11kV respectively. Calculate (a) the line voltage,(b) the ratio of capacitance between pin and earth to self-capacitance of each unit,(c)the string efficiency.

Q4. Explain the difference between nominal and equivalent T and π representations of transmission line. Show how the constantans in symmetrical T (or π) network can be found out if general circuit (ABCD) constants of the line are known and vice-versa.

Q5. Distinguish between radial and mesh distribution system? Discuss why: All ac transmission and distribution systems are 3 phase system.

Q6. Derive the expression for the capacitance of three phase unsymmetrical spaced transposed overhead transmission line.

Section – C **(10 marks each)**

Q7. a) Derive the relation for inductance(L) for single phase two wire Transmission Line & explain the effect of inductance with the increase in radius & decrease in distance between Conductors?

b) An overhead line has span of 220 meters, the line conductor weighs 684 kg-per 1000 meters. Calculate the maximum sag in the line, if the maximum allowable tension in the line is 1450kg.

Q8. a) Discuss the series and shunt compensation of a transmission line.

b) Explain various methods of laying the underground cables?

Q9. Write a note on:

(a) Grading ring

(b) Power Loci Transmission Line.