

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (EE-2011 Batch) (Sem.-4th)

POWER SYSTEM-I

Subject Code : BTEE-405

Paper ID : [A1208]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. Write short notes on :

- a) State disadvantages of HVDC transmission.
- b) Give the advantages of high voltage AC transmission.
- c) Mention limitations of Kelvin's law.
- d) Enumerate merits of bundled conductor.
- e) Define safety factor of insulator and give its significance.
- f) What is skin effect ? Why is it absent in the dc system?
- g) Define the terms feeder and distributor.
- h) What is the importance of intersheath in cables?
- i) State advantages of placing series capacitors in transmission lines.
- j) What is meant by surge impedance loading?

SECTION-B

2. Compare the volume of conductor material required in dc single phase and three-phase ac system.

3. In a 33 kV overhead line, there are three units in series. If the capacitance between each insulator pin is 10 pF and the self-capacitance of each insulator, find :
 - (a) the distribution of voltage over 3 insulators
 - (b) string efficiency.
4. A single phase transmission line has two parallel conductors of radius 1 cm. Calculate the inductance per km length of the line if the material of the conductors is :
 - (a) copper
 - (b) steel with relative permeability of 100.
5. Show how regulation and transmission efficiency are calculated for a transmission line using nominal T method. Illustrate your answer with a diagram.
6. Derive an expression for the insulation resistance of a transmission line.

SECTION-C

7. (a) What is the percentage saving in feeder copper if a 2-wire dc system is raised from 200 volts to 400 volts for the same power transmitted over the same distance and loss?
 - (b) Show that in a string of suspension insulators the middle insulator has the highest voltage across it.
 8. (a) Describe the Receiving end circle diagram for a transmission line based on ABCD constants.
 - (b) Discuss the effect of earth on capacitance of a transmission line.
- Write short notes on **any two** of the followings :
- (a) Synchronous phase modifiers
 - (b) Kelvin's law
 - (c) Compensation of transmission lines.

