Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(EE) PT (Sem.–3)

POWER SYSTEM - I (Transmission & Distribution)

Subject Code : BTEE-405

Paper ID : [A3242]

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 briefly :

a. Write the advantages of meshed distribution system over radial distribution system.

b. What is Skin effect?

c. Why is it preferable to use more than one conductor per phase rather than solid or hollow conductors?

d. What is meant by transposition of line conductors?

e. What is the basic difference between a synchronous condenser and a synchronous phase modifier?

f. What is meant by characteristic impedance of a line?

g. What do you mean by thermal resistance of cables?

h. Why voltage distribution across the insulator discs in an insulator string is not uniform?

i. What is bundling of conductors? What are the advantages of bundling of conductors?

j. A 132 kV short transmission line has an impedance of 50 Ω. Calculate the ABCD constants of the transmission line.

SECTION-B

2. What is the effect of weather conditions on sag and tension calculations. Explain by deriving suitable expressions.

3. A three phase overhead line has the following general parameters: A = $0.8705\angle 2.3^{o}$ and B = $187\angle 75.1°\Omega$. Find the MVAr rating of compensating device to maintain voltages constant at 154 kV at both ends. The load at receiving end is 50 MVA at 0.85 power factor lagging. Also determine maximum load that can be transmitted.

4. Find the GMR of 6/3 mm aluminum and 1/3 mm steel ACSR conductor.

5. Classify the cables according to insulation used, voltage rating and number of cores.

6. What is the importance of circle diagram? Also write the steps to draw receiving end circle diagram.

SECTION-C

7. Evaluate the ABCD constants of long transmission line in terms of hyperbolic functions. Also define propagation constant and characteristic impedance.

8. Determine the inductance of un-transposed flat horizontally arranged 3-phase line. The radius of each conductor is 0.03m. The spacing between phase conductors is 35 cm and distance between the phases is 4m.

9. What is string efficiency? Explain three methods to improve string efficiency.