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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

M.Code : 72165

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 have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1. Write briefly :**

- (a) State importance of voltage regulation in transmission lines.
- (b) Differentiate between hollow and bundle conductors.
- (c) Mention advantages of suspension insulators over pin type insulators.
- (d) What is meant by dielectric loss in cables?
- (e) Give advantage of series and shunt capacitors in transmission lines.
- (f) Why surge impedance loading increase with increase in voltage level?
- (g) Mention advantages and disadvantages of underground cables.
- (h) Give importance of synchronous phase modifiers.
- (i) List factors, that limit maximum transfer capability in transmission line,
- (j) Why phase shift is kept low for transmission of power for large distances?

SECTION-B

2. Explain the concept of self GMD and mutual GMD for evaluating inductance of transmission lines.
3. Deduce an expression for voltage regulation of a short transmission line, giving the vector diagram.

4. A string of 5 insulators is connected across a 100 kV line. If the capacitance of each disc to earth is 0.1 of the capacitance of the insulator, calculate:
 - a) The distribution of voltage on the insulator discs.
 - b) The string efficiency.
5. Describe with a neat sketch, the construction of a 3-core belted type cable. Discuss the limitations of such a cable.
6. Explain procedure to draw the receiving end circle diagram for a long transmission line based on ABCD constants.

SECTION-C

7.
 - a) Three conductors of a 3-phase line are arranged at the corners of a triangle of sides 2 m, 2.5 m and 4.5 m. Find the inductance per km of the line when conductors are regularly transposed. The diameter of each conductor is 1.24 cm.
 - b) State and prove Kelvin's law for size of conductor for transmission. Discuss its limitations.
8.
 - a) A 3-phase, 50Hz, 150 km line has a resistance, inductive reactance and capacitive shunt admittance of 0.1Ω , 0.5Ω and $3 \times 10^{-6} \text{ S}$ per km per phase. If the line delivers 50 MW at 110 kV and 0.8 p.f. lagging, determine the sending end voltage and current. Assume a nominal π circuit for the line.
 - b) Describe briefly various methods of laying underground cables.
9. Write short notes on the following :
 - a) Compensation of transmission lines
 - b) Radial and mesh distribution networks

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.