

22419

21819

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: 10**
- a) List standard voltage level used in India.
 - b) Define: voltage regulation of transmission line.
 - c) State the disadvantages of skin effect.
 - d) State four HVDC transmission line route on India with their voltage level.
 - e) Define: primary and secondary distribution system
 - f) State the classification of distribution substation.
 - g) State any four properties of conductor material used for overhead conductor.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Explain any four advantages of high voltage power transmission.
 - b) Describe the proximity effect and state its two disadvantages.
 - c) Draw and explain Bi-polar HVDC transmission line.
 - d) State the different methods of improving string efficiency.
Explain any one method in detail.
- 3. Attempt any THREE of the following:** **12**
- a) Draw the single line diagram of AC electric transmission and distribution system.
 - b) Explain the Ferrantio effect in detail.
 - c) Explain the grid system of distribution and state its advantages.
 - d) Draw and explain the construction of underground cables.
- 4. Attempt any THREE of the following:** **12**
- a) State the classification of transmission lines based on voltage level and length of lines.
 - b) Draw the circuit diagram and phasor diagram of nominal T method of medium transmission line.
 - c) State the limitations of EHVAC transmission line.
 - d) Draw the single line diagram (layout) of 33/11 kV substation.
 - e) Explain the shackle type insulator with neat sketch.

5. Attempt any TWO of the following:**12**

- a) Discuss the effect of transmission line parameters on the performance of transmission line (any six points).
- b) Explain the features of flexible AC transmission line (any four). State types of FACTS controller.
- c) A single phase AC distributor AB 300 M long is fed from end A and is loaded as under.
 - (i) 100 A at 0.707 pf lagging 200 m from point A.
 - (ii) 200 A at 0.8 pf lagging 300 m from point A
The load resistance and reactance of the distributor is 0.2Ω and 0.1Ω per kilometer. Calculate total voltage drop in the distributor. The load power factors refer to the voltage at the far end.

6. Attempt any TWO of the following:**12**

- a) A 3 phase line of 4 km length delivers 4000 kW at a p.f of 0.8 lagging to a load the resistance and reactance per km of each conductor are 0.2Ω and 0.5 ohm respectively if the voltage at the supply end is maintained at 11 kV. Calculate the received end voltage and efficiency of line.
 - b) Each line of a 3 ph system is suspended by a string of 3 similar insulators. If the voltage across the line unit is 17.5 kV, calculate the line to neutral voltage. Assume that the shunt capacitance between each insulator and earth is $1/8^{\text{th}}$ of the capacitance of insulator itself. Also find the string efficiency.
 - c) Draw the symbols and state their function of components used in substation (any six).
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