

17417

11920

3 Hours / 100 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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Answer any TEN of the following:

20

- a) Give the classification of transmission line according to distance and voltage.
- b) State the standard voltages for –
 - (i) Primary distribution voltage
 - (ii) Primary transmission voltage in India.
- c) State the long form of
 - (i) AAC
 - (ii) AAAC
- d) State any four components of transmission line.
- e) State the meaning of ferranti effect.
- f) State any two HVDC transmission line routes in India.
- g) State the function of following components in distribution substation : Incoming feeder, cross bracing.
- h) Draw equivalent circuit diagram of medium transmission line with nominal 'T' method.

P.T.O.

- i) State any two methods of improving string efficiency.
- j) State any two disadvantages of bundled conductor.
- k) Why three phase AC system is preferred for power transmission?
- l) State any four types of insulators used in transmission and distribution.

2. Answer any FOUR of the following: 16

- a) State the advantages of high voltage for power transmission.
- b) State the four methods of laying of cable. Also state the precautions to be taken while laying of underground cables.
- c) State any two Mechanical and Thermal properties of Insulating material.
- d) State the effect of Inductance and capacitance on performance of transmission line.
- e) What is skin effect? On what factors it depends? How skin effect can be reduced?
- f) A string of three unit suspension insulator observed to have voltage distribution on top disk 10 kv, middle disc. 13 kv, Find –
 - (i) Line voltage
 - (ii) String efficiency.

3. Answer any FOUR of the following: 16

- a) Draw the string of three suspension insulators and show the voltage distribution. Write the expression for string efficiency.
- b) What are the reasons for failure of insulator and explain any one of them briefly.
- c) Compare feeder and distributor on any four points.
- d) List the advantages and limitations of extra high voltage AC transmission line.
- e) Compare RSJ pole and steel tubular pole based on cost, life, Tensile strength and maintenance.
- f) Explain the concept of transposition of conductor. Why it is necessary?

4. Answer any FOUR of the following:**16**

- a) Draw the vector diagram of a short transmission line for lagging power factor.
- b) A single phase line is transmitting 1,100 kw power to a factory at 11 kv and 0.8 pf lagging. It has total resistance of 2Ω and loop reactance of 3Ω . Determine –
 - (i) Voltage at the sending end
 - (ii) Percentage regulation
 - (iii) Transmission efficiency.
- c) What is radial system of distribution? What are its disadvantages?
- d) What are the requirements of an ideal distribution system.
- e) What are the factors to be considered while selecting the site for substation.
- f) State the equation of A, B, C & D constants for short transmission line.

5. Answer any FOUR of the following:**16**

- a) A single phase distributor has a resistance of 0.2Ω and reactance of 0.3Ω . At the far end the voltage $V_B = 200V$, The current is 100A. and power factor is 0.8. At the midpoint A, a current of 100A is supplied at power factor 0.6 with reference to the voltage V_A at A. Find the –
 - (i) Supply voltage V_s
 - (ii) Supply end current I_s
 - (iii) Powerfactor at supply end
- b) What is meant by double circuit line? State the types of line support.
- c) Draw single line diagram of 33/11 KV substation.
- d) List the advantages and disadvantages of Indoor substation.
- e) State the factors to be considered while designing distributor.
- f) State the advantages and disadvantages of Ring main distribution system.

6. Answer any FOUR of the following:**16**

- a) Explain the effect of powerfactor on transmission efficiency and regulation.
 - b) What do you understand by the generalised constants of a transmission line? What is their significance?
 - c) Draw equivalent circuit of a medium transmission line with end condenser method. Also draw the phasor diagram.
 - d) What is Corona? What are the various conditions affecting Corona?
 - e) Draw the layout of Bipolar HVDC transmission line.
 - f) Draw symbols for the following components.
 - (i) Power transformer
 - (ii) Lightning arrester
 - (iii) CT
 - (iv) Horn gap fuse.
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