

17417

21718

3 Hours / 100 Marks

Seat No.

--	--	--	--	--	--	--	--	--	--

- 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.

**Marks**

**1. Attempt any TEN :**

**20**

- (a) State the necessity of an overhead transmission line.
- (b) State the classification of distribution system.
- (c) State the skin effect.
- (d) Explain why suspension insulators are preferred for high voltage power transmission.
- (e) State any four desirable properties of cable.
- (f) State different voltage levels used in transmission of power in India.
- (g) Define sag in overhead lines.
- (h) State proximity effect.
- (i) State any two advantages of ACSR conductors.
- (j) State any two limitations of 'EHVAC' transmission.
- (k) Define medium transmission line.
- (l) Define corona.
- (m) State different types of substation according to service requirements.
- (n) Write any two advantages and disadvantages of dc transmission.

[1 of 4]

**P.T.O.**

**2. Attempt any FOUR :****16**

- (a) Compare the merits and demerits of underground system versus overhead system. (any four points)
- (b) Explain the effects of lagging and leading pf of the load on regulation.
- (c) State the comparison between indoor and outdoor substation. (any four points).
- (d) State four factors which affects the life of line insulators and explain.
- (e) Compare HVDC transmission with EHV ac transmission (any four points).
- (f) State the functions of CT equipment of substation.

**3. Attempt any FOUR :****16**

- (a) Calculate the regulation and efficiency of a medium transmission line using “End Condenser Method”.
- (b) State the different transmission line components in the system.
- (c) State the Ferranti effect. Explain it with the help of neat phasor diagram.
- (d) Draw short transmission line and its phasor diagram for lagging power factor load.
- (e) State difference between feeder and distributor on any four points.
- (f) Draw a typical layout diagram of 11 kV distribution substation.

**4. Attempt any FOUR :****16**

- (a) With a neat diagram show the various parts of a high voltage single core cable.
- (b) Explain the factors which affect corona ?
- (c) In a 33 kV overhead line there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator find : (i) the distribution of voltage over 3 insulators and (ii) String efficiency.
- (d) How will you solve AC distribution problem ? Explain any one method.
- (e) Write construction of underground substation. Draw diagram of underground substation.
- (f) Differentiate between nominal T and nominal  $\Pi$  method (any four points).

**5. Attempt any FOUR :****16**

- (a) Explain various methods of improving string efficiency.
- (b) State the different losses present in Transmission line and explain how they affects its efficiency.
- (c) Draw a neat sketch of double circuit RCC Pole.
- (d) Explain why electric power is to be transmitted at high voltage ?
- (e) With the help of neat diagram explain the concept of transposition of conductors.
- (f) An overhead transmission line delivers 5 MW at 22 kV at 0.8 lagging power factor. The resistance and reactance of each conductor is  $4\Omega$  and  $6\Omega$  respectively. Determine sending end voltage and percentage regulation.

**P.T.O.**

**6. Attempt any FOUR :****16**

- (a) Describe ring main system of distribution with neat diagram.
  - (b) Draw a block diagram of HVDC transmission starting from Generator.
  - (c) Explain any one method of laying of cable.
  - (d) Derive the expression for ABCD constants of medium transmission line represented by  $\Pi$  circuit.
  - (e) Draw neat connection diagram of a pole mounted substation.
  - (f) Draw a diagram showing primary distribution system and secondary distribution system.
-