

CT Inst. of Eng

Roll No. 

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (EE/EEE)(Sem.-5)

**POWER SYSTEM-I (Trans. & Distribution)**

Subject Code : EE-305

Paper ID : [A0415]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

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

- Draw the graph between conductor size and cost. Also write the condition for economical conductor size.
- Explain why the ACSR conductor strands are twisted over steel wire.
- Explain formula to determine the number of strands in an ACSR conductor.
- Write the V-I equations for medium transmission line using ABCD constants.
- What are the factors affecting voltage regulation of a transmission line?
- Write the expression for centre and radius of sending-end circle diagram.
- What is the approximate value of insulation resistance of a cable? Write its expression.
- List down any four causes of underground power-cable failure.
- What is Ferranti effect? Explain.
- What do you understand by conductor sag in overhead transmission line?

**SECTION-B**

- Derive an expression for capacitance in three-core cable.
- Derive an expression for voltage drop over a uniform load.
- Derive an expression for voltage across top insulator string, also consider shunt capacitance.
- What do you mean by dielectric stress? Derive an expression for maximum potential gradients in single core cable.
- Derive equations for voltage and current of a transmission line in matrix form.

**SECTION-C**

- A two wire d.c. distributor AB is fed from both ends. A and 240V at end B. A total length of feeder is 100m. Tapped off as: 25A at 50m from end A, 50A at 100m from end A, 40A at 150m from end A. Resistance of conductor is 0.3 ohms per kilometer. Determine
  - current in various sections of the feeder.
  - minimum voltage and its location.
- A three-phase transmission line with A = 196.50  $\angle 77^\circ 18' \Omega$ ; C =  $14.298 \times 10^{-4}$  load of 40MW at 0.8 p.f. lagging at 132kV. Draw universal circle diagram for this line.

A transmission line supported over the two towers 100m above the ground and has a horizontal span of 100m. The conductor is 2500kg determine clearance below the ground at a mid-way between the towers. Conductor per metre as 0.884 kg.

