



C20-EE-403

7446

BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

DEEE – FOURTH SEMESTER EXAMINATION

POWER SYSTEMS—II (TRANSMISSION AND DISTRIBUTION)

Time : 3 Hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. State the relative merits of stranded and bundled conductors.
2. State the need of transposition in transmission lines.
3. State the factors affecting Corona.
4. What are the types of HVDC transmission system?
5. State any three requirements of line supports.
6. State the need for arcing horns and guardrings.
7. List any three disadvantages of loose spans in a transmission line.
8. Classify the cables based on insulation and lead sheathing.
9. State the need for substation.
10. List the types of distribution systems.

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **eight** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 11.** (a) State Ferranti effect and compute the rise in voltage at the receiving end due to Ferranti effect.

(OR)

- (b) Using nominal π -method, find the sending end voltage and voltage regulation of 250 km, 3-phase, 50 Hz transmission line delivers 25 MVA at 0.8 power factor lagging to a balanced load at 132 kV. The line has a series impedance of $27.5 + j97.4 \Omega$ and shunt admittance of 7.38×10^{-4} mho.

- 12.** (a) List the various types of insulators used for overhead transmission lines and explain.

(OR)

- (b) A transmission line has a span of 225 m and weight of 75 kg/100 m. The line conductor has a cross section area of 3.1 sq.cm. and ultimate breaking strength of 1250 kg/sq.cm. Line is covered with ice and its weight is 1 kg/m. If load due to wind pressure is 1.4 kg/m, then calculate maximum sag. Take safety factor as 3.

- 13.** (a) Explain the general construction of an underground cable with a neat sketch.

(OR)

- (b) What is insulation resistance of a cable and show that the insulation resistance of a cable is inversely proportional to its length.

- 14.** (a) Distinguish between indoor and outdoor substations in any eight aspects.

(OR)

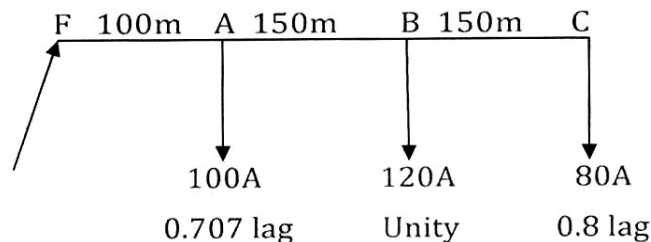
(b) Write short notes on the following :

- (i) Switch gear
- (ii) Transformers
- (iii) Metering equipment
- (iv) Lightning arresters in a substation

15. (a) Classify the distribution systems based on scheme of connection and explain.

(OR)

(b) For the single phase AC distributor as shown in the figure below, calculate the total voltage drop. The resistance and reactance are 0.25Ω and 0.125Ω for 1000 m for to and fro.



PART—C

10×1=10

- Instructions :**
- (1) Answer the following question.
 - (2) The question carries **ten** marks.
 - (3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. Analyze the causes that lead to unequal voltage distribution across string of insulators of overhead transmission line and write the remedies for it.

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