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Total No. of Pages : 02

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# B.Tech (EE) (Sem.–7) EXTRA HIGH VOLTAGE ENGG. Subject Code : EE-416 Paper ID : [A0432]

Time: 3 Hrs.

Max. Marks : 60

## INSTRUCTIONS TO CANDIDATES :

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

# **SECTION-A**

#### Q1 Answer briefly :

- a) What are the various configurations used for bundled conductors used in EHV lines?
- b) Geometric Mean Radius of Bundles conductor.
- c) What do you understand by the maximum surface gradient of a conductor?
- d) What do you understand by the corona loss?
- e) What are the significance of Radio Interference?
- f) What are the properties of Circuit breakers for EHV AC.?
- g) What is the intrinsic strength of a solid dielectric?
- h) State the Paschen's law.
- i) Name some commonly used liquids for insulation.
- j) Draw a well labeled impulse waveform.



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#### **SECTION-B**

- Q2 What are the various type of compensation used in EHV explain.
- Q3 What are the advantages and disadvantages of EHV system?
- Q4 The dimension of a 3 phase 400 KV horizontal line is at 15 m height and 11 m between each phase separation. Conductor  $2 \times 3.18$  cm dia and B = 45.72 cm. Find out the matrix of inductances per km. for un-transposed configuration and find the same with the complete transposition.
- Q5 A transformer is connected by a length of 20 meters of lines to an arrester. The rate of rise of voltage is 700kv/. The arrestor voltage is 1700 KV. Calculate the voltage across the transformer.
- Q6 What are the various types of circuits breakers used in the EHV AC transmission? Explain their uses for various purposes.

## **SECTION-C**

- Q7 A single line conductor 2.5 inch in dia of a 525 KV line (L-L) is strung 13 m above ground. Calculate :
  - a) the corona-inception voltage
  - b) the effective radius of conductor at an over voltage of 2.5 p.u. Consider a stranding factor m= 1.25 for roughness
  - c) Calculate the capacitance of conductor to ground with and without corona
  - d) If a sound conductor is strung 10 m away at the same height, calculate the coupling factors in the two cases take  $\mu = 1$ .
- Q8 Explain the breakdown mechanism of short and long air gaps by using various theories.
- Q9 Write short notes on the following :
  - a) Circuit breakers for EHV AC.
  - b) Audible Noise and Radio Interference
  - c) Surge Arrester
  - d) Voltage stability in EHC lines