

Total No. of Questions : 8]

SEAT No. :

P-580

[Total No. of Pages : 2

[6004]-520

B.E. (Electrical Engineering)

EHV AC TRANSMISSION

(2019 Pattern) (Semester - VIII) (403151A) (Elective - VI)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer all questions.*
- 2) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q.7 or Q.8.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume Suitable data if necessary.*
- 6) *Use of calculator is allowed.*

- Q1)** a) Explain Electrostatic Field of a point charge and its properties. [9]
b) Explain Field of line charges and their properties & charge potential relations for multi-conductor lines. [9]

OR

- Q2)** a) Explain design of cylindrical cage for corona gradients. [9]
b) Explain Electric shock and threshold currents [9]

- Q3)** a) Evaluate the horizontal, vertical and total value of electrostatic field components near the single circuit transmission line, which are energized by three phase voltages. [9]
b) Derive expression for electrostatic induction on an energized circuit of double circuit line. [8]

OR

- Q4)** a) Derive the expression for magnetic field calculation of horizontal configuration of Single circuit of three phase lines. [9]
b) Discuss effect of high electrostatic field on : [8]
i) Humans
ii) Animals
iii) Plants

P.T.O.

Q5) a) Explain the corona formation and methods to reduce the corona effects. [8]

b) Draw a charge-voltage diagram and derive an expression $P_c = 1/2 KC (V_m^2 - V_o^2)$ for corona loss. [9]

OR

Q6) a) With the help of simple block diagram. explain the audible noise measuring circuit in EHV AC lines. [8]

b) State and explain at least 4 formulae for power loss due to corona. [9]

Q7) a) Write note on various properties of XLPE used in EHV cables. [9]

b) Name the materials used for insulation in E.H.V cables; and state the properties of SF6 gas as an insulating in cables. [9]

OR

Q8) a) State and Explain at least four factors to be considered in the design of EHV lines based upon the steady state limits. Also state their limiting value. [9]

b) Define $\tan \delta$ loss factor and derive an expression for insulation resistance of a cable. [9]

