Total No. of Questions : 10]

P1995

SEAT No. :

[Total No. of Pages : 2

[5059]-590
B.E. (Electrical) (Semester - II) (Elective - II)
EXTRA HIGH VOLTAGE TRANSMISSION
(2012 Pattern)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) *Use of non programmable calculator is allowed.*
2) *Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 Or Q8, Q9 Or Q10.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data, if necessary.*

Q1) a) A power of 2000 MW is to be transmitted over 800 km. distance. Use 400 kV three phase ac line. Suggest the number of circuits required. With 50 percent series capacitor compensation, calculate power loss in a circuit and % power loss. Phase difference between sending end and receiving end voltage is 30°. The resistance and reactance of conductor are 0.031 ohm/km and 0.327 ohm/km respectively. **[5]**

b) Explain the need for EHV transmission lines. **[5]**

OR

Q2) a) Explain the significance of bundled conductor in EHVAC transmission system. **[5]**

b) What is effect of temperature on overhead conductors? Discuss in detail. **[5]**

Q3) a) Write a note on mechanical considerations in line performance. **[5]**

b) Explain the field of a point charge and its properties. **[5]**

OR

Q4) a) Explain the field of a sphere gap. **[5]**

b) A charge of 10 μC is placed at a distance of 2 metres from the centre of a sphere of radius 0.5 metre .Calculate the magnitude, polarity, and location of a point charge Q_2 which will make the sphere at zero potential. **[5]**

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Q5) a) Explain the concept of insulated ground wire and explain the purposes served by insulated ground wires. **[8]**

b) Derive the expression for electrostatic Field of Double-Circuit 3-phase A.C line. **[8]**

OR

Q6) a) Write effects of magnetic field on human health. **[8]**

b) Write note on primary and secondary shock currents. **[8]**

Q7) a) State and explain the mechanism of corona formation. **[8]**

b) From charge voltage diagram derive an expression for corona loss for ac voltage of conductor and compare it with Ryan Hen line formula. **[8]**

OR

Q8) a) State and explain at least 4 formulae for power loss due to corona. **[8]**

b) Write a note on 'measurement of audible noise produced by corona'. **[8]**

Q9) a) State the design factors considered under steady state condition of transmission line. Also state their limits for satisfactory performance **[9]**

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

OR

Q10) a) List the materials used for insulation in E.H.V cables; and state the properties of SF_6 gas as an insulating material used in cables. **[9]**

b) Explain detail classification of cables and mention typical insulation thickness for E.H.V cables. **[9]**