Total No. of Questions : 6]

SEAT No. :

P5165

[Total No. of Pages : 2

BE/Insem. - 570
B.E. (Electrical) (Semester - I)
EHV AC TRANSMISSION
(2012 Pattern)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates :

1) ***Use of non programmable calculator is allowed.***
2) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Unit - I

Q1) a) A power of 2000 MW is to be transmitted over a span of 800 km using 400kV and 750 kV EHV ac line. Determine the optimal number of circuits required with 50% line compensation and calculate total power loss and loss per km. **[6]**

b) Explain the terms Aeolian vibration & Galloping with respect to transmission line performance. **[4]**

OR

Q2) a) A power of 12,000 MW is required to be transmitted over a distance of 1000 km. At voltage levels of 750 kV and 1000 kV, determine the currents transmitted and the total line losses. The magnitudes for sending and receiving end voltages are equal with 30° phase difference. The line resistance and reactance values are given below. **[6]**

	750 kV	1000 kV
r (ohm/km)	0.0136	0.0036
x (ohm/km)	0.272	0.231

b) Write note on dampers and spacers. Draw the neat sketches. **[4]**

P.T.O.

Unit - II

Q3) a) Explain temperature rise of EHV conductors using heat balance equation. **[6]**

b) The conductor configuration of 750 kV EHV line are N = 4, d = 3.46cm & B = 45 cm Calculate γ_{eq}. **[4]**

OR

Q4) a) Derive an expression for total inductance of a solid round conductor due to internal and external flux linkages. **[6]**

b) What do you mean by bundled conductors? Give properties of these conductors and show conductor configurations used for bundles in EHV-lines. **[4]**

Unit - III

Q5) a) Explain Field of sphere gap and also derive equation as $S_1 S_2 = R^2$ **[6]**

b) A charge of 10 micro coulomb is placed at a distance of 2 meters from the centre of the sphere of radius 0.5 meters (1- metre diameter sphere). Calculate the magnitude, polarity and location of a point charge Q2, which will make the sphere at zero potential. **[4]**

OR

Q6) a) Explain the properties of the field of a point charge. **[6]**

b) Explain the importance of surface voltage gradient factors in extra high voltage lines. **[4]**

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