

Total No. of Questions :6]

SEAT No. :

P82

APR. -16/TE/Insem. - 14

[Total No. of Pages :2

T.E.(Electrical)

POWER SYSTEM -II

(2012 Course) (Semester - II)

Time : 1Hour]

[Max. Marks :30

Instructions to the candidates:

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q6.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Use of calculator is allowed.*
- 5) *Assume suitable data if necessary.*

- Q1)** a) Determine ABCD parameters of a long transmission line with 160km length having $r = 0.1157 \Omega/\text{km}$, $L = 0.00127 \text{ H/km}$ and $C = 0.00875 \mu\text{F/Km}$. Assume frequency is 50Hz. **[6]**
- b) Explain surge impedance & surge impedance Loading. **[4]**

OR

- Q2)** a) Determine sending end complex power, of a transmission line delivering 50MVA at 132kV, 50Hz and 0.8 power factor lagging. The ABCD constants of transmission lines are $A = D = 0.9855 \angle 0.32^\circ$, $B = 67.3 \angle 68.69^\circ \Omega$, **[6]**
- b) Write a short note on Complex power. **[4]**
- Q3)** a) Compare EHV transmission with HVDC transmission. **[5]**
- b) Give the classification of HVDC transmission system in detail. **[5]**

OR

- Q4)** a) Draw single line diagram of HVDC transmission system and explain the components used (any four). **[6]**
- b) Explain constant current control characteristic of HVDC transmission system. **[4]**

P.T.O.

- Q5) a)** In three phase overhead line the conductors have each diameter of 30mm and are arranged in the form of an equilateral triangle. Assuming fair weather conditions air density factor is 0.95 and irregularity factor 0.95. Find the minimum spacing between the conductors if the disruptive critical voltage is not to exceed 230kV between lines. Breakdown strength of air may be assumed to be 30kV Per cm (peak). [6]
- b) Explain phenomena of corona in EHV transmission lines. [4]

OR

- Q6) a)** Estimate the corona loss per phase per km by using Peek's formula for three phase 110kV, 50Hz, 150km long transmission line consisting of three conductors each of 10mm diameter and spaced 2.5m apart in an equilateral triangle formation. The temperature of air is 30°C and the atmospheric pressure of 75mm of Hg. Take the irregularity factor as 0.85. Ionization of air may be assumed to take place at a maximum voltage gradient of 30 kV. [6]
- b) What are factors and conditions affecting corona? Explain in detail. [4]

