303145

Seat No.	

T.E. (Electrical) (Semester – II) Examination, 2014
POWER SYSTEM – II
(2008 Course)

Time : 3 Hours Max. Marks : 100

Instructions *: 1) Answers to the **two** Sections should be written in **separate** answer books.*
*2) Answer **any three** questions from **each** Section.*
*3) Neat diagrams must be drawn **wherever** necessary.*
*4) Figures to the **right** indicate **full** marks.*
5) Use of Calculator is allowed.
6) Assume suitable data if necessary.

SECTION – I

1. a) Explain surge impedance loading and methods to improve it. **6**

   b) A 3Φ 132 kV overhead line delivers 50 MVA at 132 kV and power factor 0.8 lagging at its receiving end. The constants of line are A = 0.92 < 2° and B = 125 <75° Ω /phase. Find
   i) sending end voltage and power angle
   ii) sending end active and reactive power
   iii) line losses and VAR absorbed by the line. **10**

   OR

2. a) Explain the procedure for drawing the receiving end circle diagram. What information can be obtained from power circle diagram ? **8**

   b) Explain the concept of complex power and prove that apparent power S = VI*. **8**

3. a) State the factors and conditions affecting the corona loss. Give remedies. **8**

   b) Explain the advantages and disadvantages of EHVAC transmission. **8**

   OR

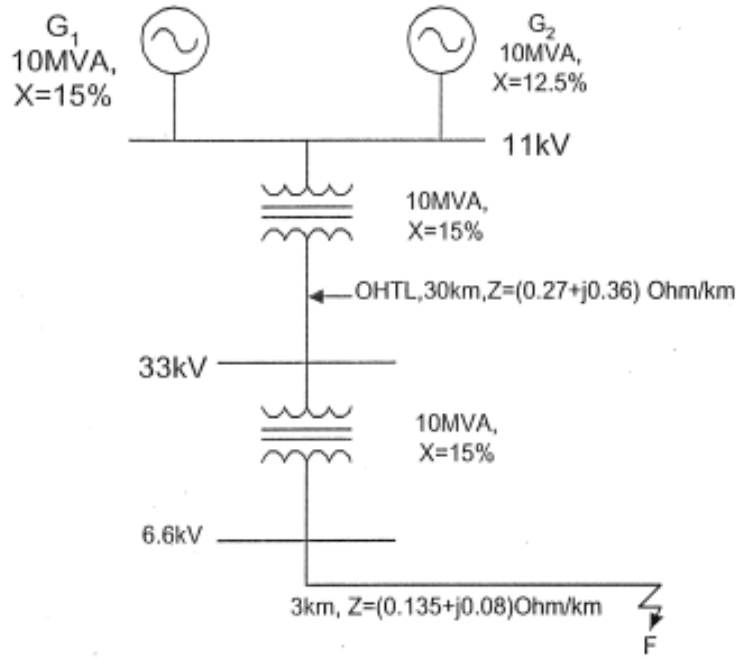
4. a) Find the disruptive critical voltage and the visual critical voltage (for local and general corona) for a three phase transmission line having 1 cm diameter conductors spaced in 3 m delta arrangement. Assume temperature 26°C, pressure 74 cm of mercury, surface factor 0.85 and irregularity factors for local visual corona 0.72 and for general visual corona 0.82. **8**

   b) How does corona occur ? What is the difference between visual critical voltage and disruptive critical voltage ? **8**

P.T.O.

5. a) Write a short note on current limiting reactor. **8**

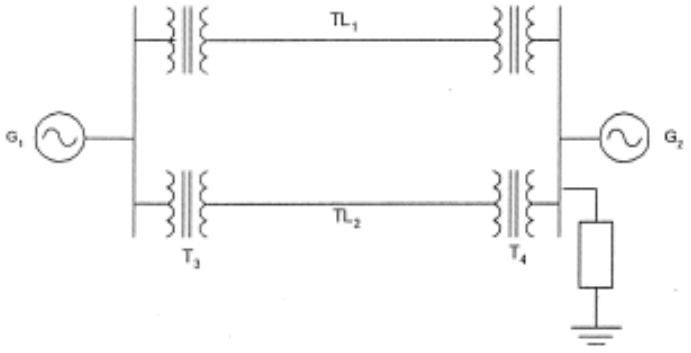
   b) Find the short circuit current and fault MVA at fault point for the radial network shown in figure. **10**



OR

6. a) Explain in detail the sub transient, transient and steady states at the three phase short circuit fault condition on an unloaded alternator. **8**

   b) Draw per unit impedance diagram for following power system. **10**



Generator G_1 & G_2 : 150 MVA, 13.8 kV, X"=15%.

Transformer T1&T2 : 100 MVA, 13.8 kV/132 kV, X =10%

Transformer T3 & T4 : 125 MVA, 125/12 kV, X =12%.

TL1 = j 45 Ω TL2 = j55 Ω

Load = 20 MW, 0.8 p.f. lagging, 11kV.

SECTION – II

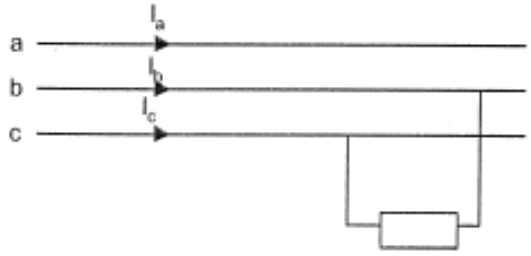
7. a) Prove that positive and negative sequence currents are equal in magnitude and out of phase in line to line fault. Draw sequence network. **8**

   b) Two 11 kV, 20 MVA, 3Φ , star connected generators operate in parallel. The positive, negative and zero sequence reactances of each being respectively, j0.18, j0.15, j0.10 p.u. The star point of one of the generators is isolated and that of the other is earthed through a 2.0 Ω resistor. A single line to ground fault occurs at the terminals of one of the generators. Estimate
   i) fault current
   ii) current in grounding resistor and
   iii) the voltage across grounding resistor. **10**

OR

8. a) Draw the equivalent circuit for zero sequence reactance of three phase transformer, for different combinations of connections. **8**

   b) A single phase load of 100 kVA is connected across lines bc of 3Φ supply of 3.3 KV. Determine symmetrical components of line currents. **10**



100 KVA load

9. a) Explain Gauss-Seidal method of load flow analysis with flow chart. **10**

   b) Give the classification of buses for load flow analysis. **6**

OR

10. a) Explain formulation of Y_{bus} using singular transformation. **8**

    b) Derive static load flow equation for n-bus system. **8**

11. a) Compare HVDC system with HVAC system. **8**

    b) Explain constant current control and constant ignition control in HVDC transmission system. **8**

OR

12. a) Explain the function of different components of HVDC transmission system with suitable diagram. **8**

    b) What are the recent development in HVDC transmission system ? Discuss future scope of HVDC transmission system in India. **8**

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