PVP 12

Code: EE6T3

III B.Tech - II Semester – Regular Examinations – May 2015

COMPUTER METHODS IN POWER SYSTEMS
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Explain the p. u. system of analysing power system problems. 7 M

   b) What are the functions of series reactors in power system? Classify them on the basis of their location. 7 M

2. a) What is the significance of symmetrical components? 7 M

   b) Derive the expressions for fault currents and voltages during fault for LG fault at p^{th} bus in an n-bus system. 7 M

3. a) Explain the π representation of off nominal tap changing transformers. 7 M

   b) Derive the expression for Y_{bus} matrix using singular transformation. 7 M

4. a) Define load flow problem. Classify the buses in power system and discuss the importance of Slack bus. 7 M

b) Develop load flow equations and explain Gauss Seidel method of load flow solution. 7 M

5. Explain N-R (rectangular) method of load flow solution when the system contains load and generator buses. Also draw the flow chart. 14 M

6. Using step by step procedure, determine the Z_{BUS} for the network when an element is added from a new bus to an old bus. 14 M

7. Derive the fault impedance matrix in Phase (Z_F^{abc}) & Symmetrical components (Z_F^{012}) for a three phase fault. 14 M

8. a) Define critical clearing angle and derive an expression for critical clearing angle. 7 M

b) A generator operating at 50Hz delivers 1p.u. power to an infinite bus through a transmission circuit in which resistance is ignored. A fault takes place reducing the maximum power transferable to 0.5 p.u . The maximum power transferable before the fault was 2.0 p.u. and after the clearance of the fault, it is 1.5 p.u. By the use of equal area criterion, determine the critical clearing angle. 7 M