

GUJARAT TECHNOLOGICAL UNIVERSITY
ME SEMESTER – I EXAMINATION – SUMMER 2017

Subject Code: 2710711**Date: 09/05/2017****Subject Name: COMPUTER METHODS IN POWER SYSTEM ANALYSIS****Time: 02:30 p.m. to 05:00 p.m.****Total Marks: 70****Instructions:**

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

- Q.1** (a) Prepare a flowchart for GS method of power flow analysis. **07**
(b) How optimal load flow differs from the load flow? Explain any one method used for solution of optimal power flow. **07**
- Q.2** (a) Describe Fast Decoupled Load Flow Algorithm with Flow chart. **07**
(b) What is Jacobin matrix used in N R method of load flow study? Consider a power system with total n number of buses. Out of which m number of buses are PV buses. Find size of Jacobian also find the size of each sub matrices of Jacobian [J1, J2, J3 and J4] where, notations have usual meanings. **07**
- OR**
- (b) Derive the equation for Y_{BUS} in terms of the incidence matrix 'A' and primitive admittance matrix 'y' from first principles. **07**
- Q.3** (a) Define and explain (1) Generation shift factor (2) Line outage distribution Factor **07**
(b) Explain AC power flow method for security analysis. **07**
- OR**
- Q.3** (a) Explain performance index. How is it useful to contingency selection? **07**
(b) Explain Symmetrical Fault Analysis using Bus Impedance Matrix with its Algorithm. **07**
- Q.4** (a) With suitable example explain the LSE and WLSE. **07**
(b) Explain the procedure for detection & indentification of bad measurements in relation to state estimation. **07**
- OR**
- Q.4** (a) What are the advantages of state estimation in power system? Explain orthogonal decomposition method for state estimation. **07**
(b) Explain the network observability and pseudo measurements in relation to state estimation. **07**
- Q.5** (a) Take an example of a full square matrix of size (3 by 3) and obtain upper triangular matrix from the same. Explain the steps. **07**
(b) Write the differential equations for power system stability. Write steps to solve these equations using numerical techniques. **07**
- OR**
- Q.5** (a) Explain Range-Kutta method for numerical integration with suitable example. **07**
(b) Explain One step method of Numerical Integration technique. **07**
