

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME – SEMESTER I (NEW) – • EXAMINATION – SUMMER 2016**

**Subject Code: 2710711**

**Date: 17/05/2016**

**Subject Name: COMPUTER METHODS IN POWER SYSTEM ANALYSIS**

**Time: 02:30 pm to 05:00 pm**

**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) What is the optimal load flow? Explain any one method used for solution of optimal power flow. **07**
- (b) Derive the equation for  $Y_{BUS}$  in terms of the incidence matrix 'A' and primitive admittance matrix 'y' from first principles. **07**
- Q.2** (a) Describe the NR algorithm for power flow analysis. **07**
- (b) Define and explain Fundamental Loop Matrix with example. **07**
- OR**
- (b) Prepare a flowchart for GS method of power flow analysis. **07**
- Q.3** (a) Describe the contingency analysis procedure with appropriate flow chart. **07**
- (b) Explain Linear Sensitivity factors, Generation shift factor and line outage distribution factor for Power System Security. **07**
- OR**
- Q.3** (a) Explain performance index (PI). How it is useful for contingency selection? **07**
- (b) Explain concentric relaxation technique with suitable example. **07**
- Q.4** (a) Prepare a flowchart for least square state estimation. **07**
- (b) Explain the procedure for detection & identification of bad measurements in relation to state estimation. **07**
- OR**
- Q.4** (a) Explain the network observability and pseudo measurements in relation to state estimation. **07**
- (b) Explain state estimation by orthogonal decomposition. **07**
- Q.5** (a) Explain One step method of Numerical Integration technique. **07**
- (b) Describe Fast Decoupled Load Flow Algorithm with Flow chart. **07**
- OR**
- Q.5** (a) Explain the Forward Euler method with suitable example **07**
- (b) Explain Range-Kutta method for numerical integration with suitable example **07**

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