

Student Exam No:- \_\_\_\_\_

GANPAT UNIVERSITY  
M.TECH SEM-I ELECTRICAL ENGINEERING  
REGULAR EXAMINATION JAN-2013

3EE102:-COMPUTER METHODS IN POWER SYSTEM ANALYSIS

Time: 3 Hours

Total Marks:-70

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

SECTION-I

- Que-1** (a) Derive the equation of Bus Admittance Matrix ( $Y_{bus}$ ). [12]  
(b) What do you mean by sparse matrix? Explain its significance in power system network.

OR

- Que-1** Give a flow chart for a load flow study using NR method. How does the method get modified when P-V buses are also present? [12]

- Que-2** Explain how short-circuit analysis is carried out for a multi node system using bus impedance matrix. Also explain Z-bus building algorithm. [11]

OR

- Que-2** Explain how asymmetrical fault analysis is carried out using Z-bus matrix. How this method is different than symmetrical component method which uses voltage and current equations. [11]

- Que-3** Compare Gauss Siedel, Newton Raphson, Decoupled and Fast Decoupled load flow methods with respect to memory requirement, speed, application and other network parameters. [12]

SECTION-II

- Que-4** (i) Explain the importance of load forecasting? [12]  
(ii) Define Lead Time and explain how it varies according to the nature of forecast.  
(iii) Why accuracy of load forecasting is important? What will happen if load Forecast is too low or too high?

OR

- Que-4** (i) Discuss various load forecasting approach along with their relative merits and demerits. [12]  
(ii) Discuss how deterministic and stochastic component of load duration curve are estimated?

Que- 5

[11]

- (a) Explain the method of ordinary Least Square Error technique.
- (b) Explain the following terms with reference to contingency analysis.
  - (i) Contingency Definition
  - (ii) Contingency selection & evaluation

OR

Que- 5

[11]

- (a) Explain the method of Weighted Least Square Error technique.
- (b) Draw and explain operating states and control actions of a power system.

Que-6

[12]

What is the need of real time and computer control of power system? Also, explain the importance and advantages of SCADA and energy management centers in power system.

END OF PAPER

Best of Luck