

M. Tech. Electrical Power System (CBCS Pattern) Sem-II
PEPS241 - Computer Application in Power Systems (Elective-II)

P. Pages : 2

Time : Three Hours

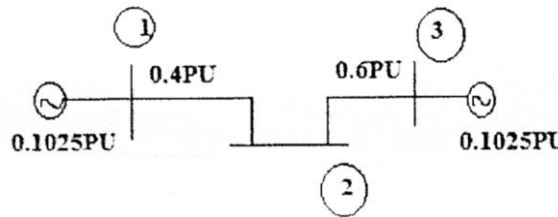


GUG/W/22/11025

Max. Marks : 70

- Notes :
1. All questions carry equal marks.
 2. Answer **five** questions.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.
 6. Use of non programmable calculator is permitted.

1. a) Derive an expression for loop impedance matrix using singular transformation. 7
- b) Find YBR for a power system shown in figure. Positive sequence reactance's of the component are marked on diagram. 7



2. a) Develop the expression for formation of three phases Z_{bus} for the element which is added between two existing buses in a partial network. 7
- b) Derive equation for flux linkage across dqo axes using dqo transformation. 7
3. a) Using suitable transformation matrix 'T' show that the phase variables in power system can be transformed into new set of 012 variables given by $Z_{pq}^{012} = (T^*)^t Z_{pq}^{abc} T$, where T is symmetrical component transformation matrix. 7
- b) Derive expression for performance equation of three rotating element in impedance form when excitation is balance. 7
4. a) Give a flow chart for load flow study using Newton-Raphson method. How does the method get modified to account for PV buses? 7
- b) What are the advantages of Y_{bus} over Z_{bus} ? Derive equations for elements of jacobian using polar coordinates. 7
5. a) Deduce and draw the sequence network for LLG fault at the terminal of unloaded generator. 7

- b) For a three phase to ground fault at Bus 'P' in a power system derive an expression for: **7**
- i) Fault current
 - ii) Faulted Bus voltage
 - iii) Voltages at other buses during fault
 - iv) Current through network elements during fault
- 6.** a) What are the different types of buses named in load flow analysis? Mention the known and unknown quantities on each bus. **7**
- b) Explain load flow analysis using Gauss-Seidal Iterative solution with the help of flow chart. **7**
- 7.** a) Explain the objectives of transient stability studies. State the assumptions made for transient stability studies. **7**
- b) With the help of flow chart discuss the algorithm to be used for transient stability analysis of power system employing R_K4 method. **7**
- 8.** a) Explain unit commitment using dynamic programming method. **7**
- b) Derive coordinate equation using Lagrange method for the solution of Economic schedule. **7**
