

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024****Subject Code:2170901****Date:11-12-2024****Subject Name:Interconnected Power System****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

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|------------|-----|--|-----------|
| Q.1 | (a) | What is meant by interconnected power system? State its advantages. | 03 |
| | (b) | What is Power system islanding? Why it is idea procedure to restore the grid? Discuss the effect of islanding. | 04 |
| | (c) | Explain Speed governing mechanism with appropriate Figure. | 07 |
| Q.2 | (a) | When penalty factor is to be considered for optimum generation scheduling? | 03 |
| | (b) | Write Short Note on Load dispatch center. | 04 |
| | (c) | Explain the terms critical clearing angle and critical clearing time in connection with transient stability of a power system. | 07 |
| OR | | | |
| Q.3 | (c) | Discuss Z_{bus} building algorithm. Explain all types of modifications when transmission lines are added between buses | 07 |
| | (a) | When the generator bus is treated as load bus? | 03 |
| | (b) | Define the Terms with examples: i) Graph ii) Sub Graph iii) Co-tree iv) Tree. | 04 |
| | (c) | What is penalty factor? Establish a condition for optimal load dispatch with consideration of the transmission losses. | 07 |
| OR | | | |
| Q.3 | (a) | State three assumptions made in solving the swing equation. | 03 |
| | (b) | Discuss Power Generation Scenario in Gujarat. | 04 |
| | (c) | Discuss numerical solution of swing equation using point by point method. | 07 |
| Q.4 | (a) | What are the advantages of Ybus. | 03 |
| | (b) | Compare NR and GS method for load flow analysis. | 04 |
| | (c) | Explain Gauss –Seidel method for load flow solution. | 07 |
| OR | | | |
| Q.4 | (a) | Why bus admittance matrix is used in Gauss Seidal instead of bus impedance matrix. | 03 |
| | (b) | Write advantages and disadvantages of inter connected power system. | 04 |
| | (c) | Explain the importance of voltage control in power system and describe any one method for voltage control. | 07 |
| Q.5 | (a) | Write a short note on Blackout. | 03 |
| | (b) | Explain the selective frequency control. | 04 |
| | (c) | Derive transmission loss formula (Kron's method). | 07 |
| OR | | | |
| Q.5 | (a) | Explain the concept of equal area criterion | 03 |
| | (b) | Explain: (i) Bus incidence matrix (ii) Primitive network. | 04 |
| | (c) | Explain steady state stability and Transient stability for synchronous generator connected with infinite bus. | 07 |