

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) EXAMINATION – SUMMER 2024

Subject Code:2180909

Date:21-05-2024

Subject Name:Power System Operation and Control

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.**

	Marks
Q.1 (a) Describe restoration process after black out of power system.	03
(b) Discuss surge impedance loading.	04
(c) What is power system security? Explain Power system security levels in Detail.	07
Q.2 (a) Explain speed governor dead-band and its effect on AGC.	03
(b) Discuss load frequency control with generator rate constraints.	04
(c) Explain role of load dispatch centre in power system. What is its role as a part of national grid?	07
OR	
(c) Describe speed governing system for controlling real power flow in the system.	07
Q.3 (a) Enumerate the need for restructuring.	03
(b) Explain the role of transformer on voltage control of power system.	04
(c) Describe the assessment practices to control voltage and reactive power.	07
OR	
Q.3 (a) Interpret Network Observability and Pseudo Measurement.	03
(b) Obtain necessary relation between maximum power and line length.	04
(c) Enlist different types of reactive power compensation methods for heavily loaded and voltage stressed power systems. Explain static VAR compensators in detail.	07
Q.4 (a) Describe steps for detection of bad data.	03
(b) Provide Basic solution for Least Square estimation.	04
(c) Describe Auto-Regressive Model and Auto- regressive Moving Average Model for load forecasting.	07
OR	
Q.4 (a) On which factor success of deregulation and restricting in power system is depending?	03

- (b) Discuss the comparison between state estimation and load Flow study. **04**
- (c) What do you mean by deregulated power system? Discuss its advantages and relative limitations to vertical integrated system. **07**
- Q.5** (a) State research and professional bodies of Indian Power Sector. **03**
- (b) Define (i) State variables, (ii) Measurement variables, and (iii) Redundancy or degree of freedom. **04**
- (c) How does deregulated power system differs from vertically integrated electric industry? **07**
- OR**
- Q.5** (a) Discuss the below given terminologies related to deregulation of power system **03**
(i) Unbundling (ii) Wheeling (iii) Recall-ability
- (b) Give flow chart of one scheme of fast decoupled state estimation. **04**
- (c) Illustrate standard analytical functions used for Extrapolation techniques involve trend curve fitting in load forecasting. **07**
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