

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VIII EXAMINATION-SUMMER 2023****Subject Code: 2180909****Date: 28/06/2023****Subject Name: Power System Operation and Control****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Give the classification of voltage stability.	03
	(b) Explain in brief: Cascade tripping and Black out.	04
	(c) Describe Auto-Regressive Model and Auto-regressive Moving Average Model for load forecasting.	07
Q.2	(a) List out important points of electricity act 2003	03
	(b) Write short note on state estimation.	04
	(c) Draw hierarchy of Load dispatch centers in India. Also list out locations of NLDC, Regional LDCs and that of ALDCs of Western Region.	07
OR		
	(c) Explain meaning of deregulated power system. Discuss its advantages and limitations in relation to vertically integrated system.	07
Q.3	(a) State main components of Automatic voltage control scheme.	03
	(b) Define generation shift factor and line outage distribution factor in relation to security analysis.	04
	(c) Develop step by step the mathematical model for a state estimator using line power flows with the help of weighted least square method.	07
OR		
Q.3	(a) Explain concept of power system security.	03
	(b) Define voltage collapse. Enlist the main factors that contribute the phenomena of voltage collapse.	04
	(c) With diagram explain flow chart for contingency selection.	07
Q.4	(a) Explain speed governor dead-band and its effect on AGC.	03
	(b) Explain restoration process after black out.	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
OR		
Q.4	(a) Derive necessary relation between maximum power and line length.	03
	(b) Explain role of load dispatch center in power system.	04
	(c) State and explain various operating states of power systems with necessary diagrams.	07
Q.5	(a) What is bad data in state estimation?	03
	(b) Explain importance of state estimation in power system.	04
	(c) Prove that the receiving end voltage is extremely sensitive to any change in power status at the receiving end bus.	07

OR

- Q.5** (a) Discuss the sources of reactive power generation in the power systems. **03**
(b) Describe steps for detection of bad data. **04**
(c) Develop an expression to find the magnitude of reactive power requirement for voltage control in long transmission lines. **07**
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