

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (NEW) EXAMINATION – WINTER 2022****Subject Code:2180909****Date:14-12-2022****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) Compare economic dispatch and load frequency control	03
(b) Discuss voltage regulation	04
(c) Discuss power system static security levels	07
Q.2 (a) What is voltage collapse? Enlist the factors responsible for it.	03
(b) Discuss the nature of load forecasting and its applications	04
(c) Discuss average and trend curve methodology used for load forecasting	07
OR	
(c) Discuss auto-regressive models used for load forecasting	07
Q.3 (a) Role of state estimator in power system	03
(b) What is loadability limit of the line?	04
(c) Two generating units rated for 110 MW and 210 MW has governor speed regulation of 5.0 and 4.0 percent from no-load to full-load, respectively. They are operating in parallel and sharing a load of 310 MW. Assuming free governor action, determine the load shared by each unit.	07
OR	
Q.3 (a) Define (i) State variables, (ii) Measurement variables, and (iii) Redundancy factor	03
(b) What is surge impedance and surge impedance loading?	04
(c) Discuss model of load frequency control	07
Q.4 (a) Discuss the P-V curves considering different operating power factor	03
(b) Discuss maximum power transfer considering uncompensated transmission line	04
(c) Discuss weighted least square estimation technique used for state estimation of power system.	07
OR	
Q.4 (a) Discuss Reactive Power -Voltage (Q-V) concept	03
(b) Discuss the factor reactive power mismatch considering aspects of voltage control.	04
(c) Determine the size of matrices for below mentioned parameter from figure-1 using weighted least square estimation technique for state estimation.	07
(i) Matrix of state variables	
(ii) Matrix of measurement variables	
(iii) H-Matrix,	
(iv) Gain matrix	
(v) Matrix of Weighting factor (considering each meter is 90% accurate)	

- Q.5** (a) What is motivation for restructured power system? **03**
 (b) What is un-bundling of Electrical Power Sector? **04**
 (c) Discuss the role of conjunction management in deregulated power system **07**

OR

- Q.5** (a) What is power system deregulation? State its advantages **03**
 (b) Discuss the following **04**
 (i) Wheeling (ii) Available Transfer Capability (iii) Transmission Reliability Margin (iv) Total Transfer Capability
 (c) Discuss the role of System Administrator/Independent System Operator in deregulated Power System **07**

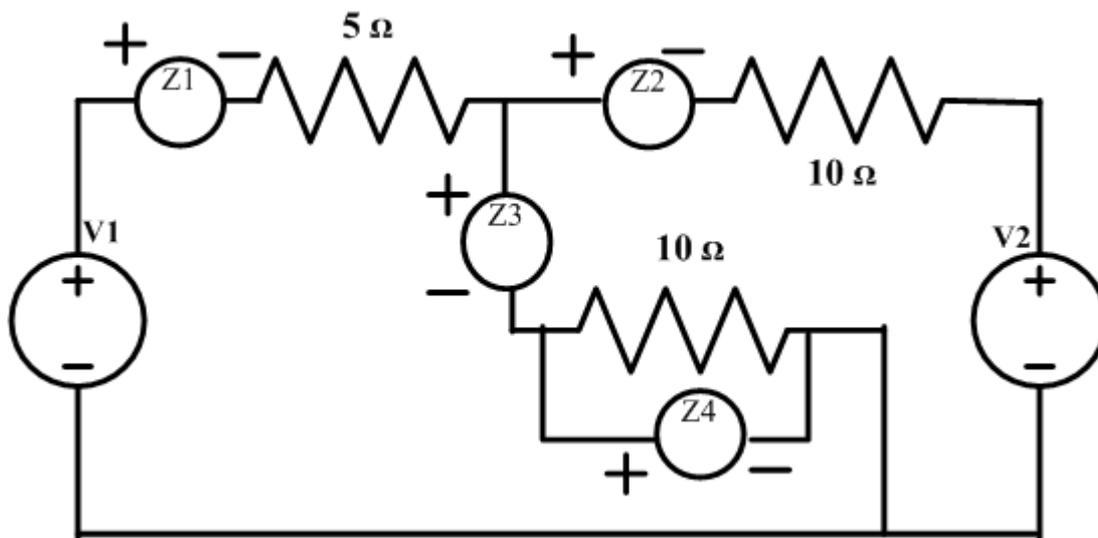


Figure 1
