

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII EXAMINATION – SUMMER 2020****Subject Code: 2180909****Date: 28/10/2020****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.

- Q.1**
- | | | |
|-----|--|-----------|
| (a) | List main components of Automatic voltage control scheme. | 03 |
| (b) | Explain economical dispatch control for single area case. | 04 |
| (c) | What is power system security? Explain Power system security levels in Detail. | 07 |

- Q.2**
- | | | |
|-----|--|-----------|
| (a) | What do you mean by state estimation? | 03 |
| (b) | List out the reasons which motivate to restructure the power system. | 04 |
| (c) | Two generators rated 200MW and 400 MW are operating in parallel. The droop characteristics of their governors are 4% and 5%, respectively from no load to full load. Assuming that the generators are operating at 50 Hz at no load, how would a load of 600MW be shared between them? What will be the system frequency at this load? Assume free governor operation. | 07 |

OR

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|-----|--|-----------|
| (c) | Explain Basic Solution of Least Square Estimation. | 07 |
|-----|--|-----------|
- Q.3**
- | | | |
|-----|---|-----------|
| (a) | Obtain necessary relation between maximum power and line length. | 03 |
| (b) | Explain function of different entities in deregulated power system. | 04 |
| (c) | What is bad data in state estimation? How bad data are detected and suppress in state estimation. | 07 |

OR

- Q.3**
- | | | |
|-----|---|-----------|
| (a) | Explain Concept of Black out. | 03 |
| (b) | Show and discuss profile of reactive power losses in transmission line. | 04 |
| (c) | Give flow chart for contingency selection. | 07 |
- Q.4**
- | | | |
|-----|---|-----------|
| (a) | Compare static state estimation and dynamic state estimation. | 03 |
| (b) | Explain significance of 'w' in weighted least square estimation. | 04 |
| (c) | Describe Auto-Regressive Model and Auto-regressive Moving Average Model for load forecasting. | 07 |

OR

- Q.4**
- | | | |
|-----|--|-----------|
| (a) | Explain classification of Voltage Stability. | 03 |
| (b) | Give flow chart of one scheme of fast decoupled state estimation. | 04 |
| (c) | What do you mean by deregulated power system? Discuss its advantages and relative limitations to vertical integrated system. | 07 |
- Q.5**
- | | | |
|-----|---|-----------|
| (a) | List a few practical aspects for describing the reactive power flow problem in voltage collapse | 03 |
| (b) | Explain various applications of state estimations in power systems. | 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.5** (a) Draw a neat sketch of turbine speed governing system. **03**
(b) What is the role of load forecasting? How it reflects in future trends? **04**
(c) Establish relationships between voltage regulation and reactive power. Explain **07**
how it is governed by short-circuits capacity.
