

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2018**

**Subject Code: 2180909**

**Date: 02/05/2018**

**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.

	<b>MARKS</b>
<b>Q.1</b> (a) Discuss concept of black out.	<b>03</b>
(b) Explain restoration process after black out.	<b>04</b>
(c) For a transmission line connected between two buses, derive the expression of voltage regulation and also prove from the phasor diagram that the Q and V have a strong coupling.	<b>07</b>
<b>Q.2</b> (a) Explain speed governor dead-band and its effect on AGC.	<b>03</b>
(b) Draw block diagram model of load frequency control for isolated power system.	<b>04</b>
(c) Explain turbine speed governing system.	<b>07</b>
<b>OR</b>	
(c) Explain contingency analysis of power system.	<b>07</b>
<b>Q.3</b> (a) What is voltage collapse? Enlist the main factors that contribute the phenomena of voltage collapse.	<b>03</b>
(b) Discuss the sources of reactive power generation in the power systems.	<b>04</b>
(c) Describe the various operating states of power systems.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Explain classification of Voltage Stability.	<b>03</b>
(b) Explain the role of transformer on voltage control of power system.	<b>04</b>
(c) Enlist different types of reactive power compensation methods for heavily loaded and voltage stressed power systems. Explain static VAR compensators in detail.	<b>07</b>
<b>Q.4</b> (a) What do you mean by state estimation?	<b>03</b>
(b) Explain power system security.	<b>04</b>
(c) What is bad data in state estimation? How bad data are detected and suppress in state estimation.	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) Explain least square estimation in brief.	<b>03</b>
(b) Discuss External System Equivalency.	<b>04</b>
(c) Explain various applications of state estimations in power systems.	<b>07</b>
<b>Q.5</b> (a) Explain deregulated power system structures.	<b>03</b>
(b) Give classification based on lead time and forecasting methodology.	<b>04</b>
(c) Describe Auto-Regressive Model and Auto-regressive Moving Average Model for load forecasting.	<b>07</b>
<b>OR</b>	
<b>Q.5</b> (a) Explain load predictions for load forecasting.	<b>03</b>
(b) Explain function of different entities in deregulated power system.	<b>04</b>
(c) What do you mean by deregulated power system? Discuss its advantages and relative limitations to vertical integrated system.	<b>07</b>

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