

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME – SEMESTER (NEW) - EXAMINATION – SUMMER - 2017**

**Subject Code:2730706****Date:02/05/2017****Subject Name: Power System Dynamics 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) Draw general functional block diagram of an excitation control system. And explain the function of each block. **07**
- (b) How to determine parameters of equivalent circuits of synchronous machine. i.e. reactance, time constant. Derive any one reactance and time constant of stator circuit. **07**
- Q.2** (a) What is PSS? Explain with neat block diagram. **07**
- (b) What is SSR? Explain with neat diagrams. **07**
- OR**
- (b) Draw general functional block diagram of steam turbine and governor control system. And explain the function of each block. **07**
- Q.3** (a) Classify the system load. Also state various mathematical models to represent system load. **07**
- (b) Explain SVC. Write all the family members of SVC and explain one of them. **07**
- OR**
- Q.3** (a) Using Park transformation, derive voltage equation of synchronous machine. **07**
- (b) Derive D-Q model for transmission line. **07**
- Q.4** (a) What is voltage stability? What are the factors that affect voltage stability? **07**
- (b) Write characteristics equation for SMIB system. How Routh-Herwitz criteria is used for small signal stability analysis. Explain **07**
- OR**
- Q.4** (a) What are different types of models used to represent synchronous machine in power system dynamics. Write application and limitations of each type of model. **07**
- (b) What are the Discrete Supplementary Controls? Explain any one. **07**
- Q.5** (a) Draw general functional block diagram of hydro turbine and governor control system. And explain the function of each block. **07**
- (b) Comparison of Angle and Voltage Stability. **07**
- OR**
- Q.5** (a) Write about simplified model used for analysis of multi machine system. **07**
- (b) Explain energy equilibrium theorem applied for power system stability. What is SEP and UEP explain with an example. **07**

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