Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (OLD) EXAMINATION – SUMMER 2017

Subject Code:1720703 **Date:11/05/2017**

Subject Name: Power System Dynamics & Control

Time:10:30 A.M. to 01:00 P.M. **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)**	What is the significance of load modeling? Explain various load modeling with suitable equations.	**07**
	(b)	What is meant by SVC? Explain variable impedance type SVC.	**07**
Q.2	**(a)**	Explain Various types of Power system oscillations may take place. How PSS is useful to damp out the oscillations?	**07**
	(b)	Derive Mutual Inductance matrix for synchronous machine.	**07**
		OR	
	(b)	Classify and explain models of synchronous machine defined by IEEE.	**07**
Q.3	**(a)**	Derive equation for power delivered for round and salient pole rotor; discuss effect of saliency on PG (δm) curve.	**07**
	(b)	Briefly describe Park's transformation and explain its importance in power system analysis.	**07**
		OR	
Q.3	**(a)**	Explain transmission line modeling by D-Q transformation using α-β variables.	**07**
	(b)	Write a short-note on Hopf Bifurcation?	**07**
Q.4	**(a)**	Sketch model of speed governing system for hydro-turbines and discuss permanent droop and transient droop.	**07**
	(b)	Draw the equivalent circuit of a synchronous machine and derive the equation of its instantaneous power output.	**07**
		OR	
Q.4	**(a)**	Sketch model of speed governing system for steam-turbines and explain.	**07**
	(b)	Discuss small signal stability analysis of SMIB with the help of state space representation.	**07**
Q.5	**(a)**	State assumptions made multi machine system and develop simplified system model for the same.	**07**
	(b)	Compare classical method of transient stability analysis with modern methods.	**07**
		OR	
Q.5	**(a)**	Mention different types of excitation systems. Draw and explain the block diagram of any one of them.	**07**
	(b)	Explain the effect of field current on synchronous machine terminal voltage with vector diagram.	**07**

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