PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech. Winter 2017 - 18 Examination

Semester: 2   Date: 09/01/2018
Subject Code: 03203152   Time: 02:00 pm to 04:30 pm
Subject Name: Power System Dynamics & Stability   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1	A) What do you mean by power system stability and discuss the small signal stability and transient stability?	**(05)**
	B) Discuss the classification of power system stability?	**(05)**
	C) What is the nature of small disturbance response with help of graphical representation and phasor diagram?	**(05)**
Q.2	**Answer the following questions**. (Attempt any three) (Each five mark)	**(15)**
	A) Discuss the different type of oscillation in small signal stability?	
	B) What is the significance of power vs angle relationship in rotor angle stability?	
	C) What is the necessity of Park's transformation for modeling of synchronous machine?	
	D) Derive expression of flux linkage of an ideal synchronous generator in term of park's variable.	
Q.3	A) Derive the expression of voltage and current in d & q axis in small signal stability of single machine infinite bus	**(07)**
	B) Discuss with diagram of flux path of various reactances of salient pole synchronous machine.	**(08)**

OR

B) Derive the system characteristics equation for small signal analysis of a single machine infinite

bus (SMIB) system (using classical model of generator).The equation of motion required for

calculation in pu are given by   **(08)**

$$p\Delta \omega r = (1/2H)(Tm - Te - K_D \Delta \omega_r)$$

$$p\delta = \omega o \, \Delta \omega r$$

Q.4	A) Discuss about the system stability based on mode shapes determined using eigen value analysis of the linear system.	**(07)**

OR

	A) Explain the concept of R-I frame for the analysis of multi machine system	**(07)**
	B) According to CIGRE, state what is meant by voltage instability and voltage collapse?	**(08)**