Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– III (NEW) EXAMINATION – SUMMER 2017

Subject Code: 2734501 **Date:02/05/2017**

Subject Name: Application of Power Electronics to Power System

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)**	Explain operation of Thyristor Control Rectifier (TCR).	**07**
	(b)	Explain the operation of Static Synchronous Series Capacitor (SSSC).	**07**
Q.2	**(a)**	Give classification of FACTS devices and their advantages.	**07**
	(b)	With phasor diagram explain load compensation and system compensation.	**07**
		OR	
	(b)	Explain the FC-TCR configuration. Explain operating characteristic without step down transformer and losses in FC-TCR.	**07**
Q.3	**(a)**	Derive an expression for mid-point voltage of a symmetrical lossless transmission line as a function of power flow on it.	**07**
	(b)	Explain the construction and working of IPFC.	**07**
		OR	
Q.3	**(a)**	Discuss the influence of SVC on the system voltage to which it is connected through coupling transformer.	**07**
	(b)	Discuss the role of SVC as a voltage controller.	**07**
Q.4	**(a)**	Briefly describe the working of a Thyristor Controlled Transformer (TCT).	**07**
	(b)	Draw and explain the V-I characteristics of STATCOM and give a brief comparison with the V-I characteristics of TSC-TCR.	**07**
		OR	
Q.4	**(a)**	Explain the construction and working of a UPFC.	**07**
	(b)	Explain the application of STATCOM for improving transient stability of a power system. Discuss the control strategy used.	**07**
Q.5	**(a)**	Explain the principle of operation of basic Thyristor-Controlled Series Capacitor (TCSC) scheme.	**07**
	(b)	Discuss the importance of having slope in the dynamic characteristic of SVC.	**07**
		OR	
Q.5	**(a)**	Explain synchronous reference frame theory.	**07**
	(b)	Draw and explain compensating voltage verses line current characteristics of TCSC in voltage control mode and reactance control mode.	**07**

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