Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VIII.EXAMINATION – WINTER 2016

Subject Code: 180907 **Date: 24/10/2016**

Subject Name: Advanced Power Electronics II (Department Elective - II)

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)	Define & Explain break even distance for transmission line. For how much distance the HVAC line is preferable to install with & without supporting FACTS devices?	07
	(b)	Give brief comparison of different SVCS.	07
Q.2	(a)	Explain operation of six pulse converter in inversion mode with necessary diagram and waveform.	07
	(b)	Explain the effect of source inductance on converter output voltage. Also obtain expression of DC output voltage with overlap angle.	07
		OR	
	(b)	Derive the equation of instantaneous power and define active and reactive power from it. Also draw waveforms of active and reactive power.	07
Q.3	(a)	In view of reactive power control, explain working of synchronous condensers with schematic diagram.	07
	(b)	Draw schematic diagram of HVDC transmission system and explain working of each component in brief.	07
		OR	
Q.3	(a)	Draw the diagram of Graetz circuit and also obtain the expression of output voltage.	07
	(b)	State & discuss the factors to be given due care while designing the Shunt & Series compensators.	07
Q.4	(a)	Explain the working of three phase Thyristor Controlled Reactor (TCR) with neat diagrams. How to reduce harmonics introduced by three phase TCR?	07
	(b)	State advantages of HVDC transmission over EHVAC transmission for bulk power transmission.	07
		OR	
Q.4	(a)	Derive equation showing effect of series compensation on power transfer capability of transmission line. State advantages and limitations of series compensation.	07
	(b)	Explain conventional methods of real power control in the transmission line.	07
Q.5	(a)	Write a short note on Emerging transmission networks with relevant diagram.	07
	(b)	Give comparison between CSC (Classical HVDC) and HVDC-VSC systems.	07
		OR	
Q.5	(a)	Explain the hierarchical control scheme for a DC link.	07
	(b)	Give brief details with sketch of various HVDC links. Also state which link is preferable?	07

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