Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIIth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 170906 **Date: 29/05/2012**

Subject Name: Advanced Power Electronics-I

Time: 02:30 pm – 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 diode clamped 3-level inverter configuration. Draw gate signals and inverter terminal voltage of one phase.	**07**
	(b)	Discuss L type ZCS resonant inverter with neat circuit diagram and waveform.	**07**
Q.2	**(a)**	Draw circuit diagram and output voltage phasor diagram of 12-pulse converter. Explain 5th and 7th harmonics elimination in 12-pulse converter.	**07**
	(b)	Draw circuit diagram of single phase multilevel cascaded H bridge inverter. Explain its working principle and mention its features, advantages and limitations.	**07**
		OR	
	(b)	Explain flying capacitors multilevel inverter topology. Compare it with other multilevel inverter topologies.	**07**
Q.3	**(a)**	Explain concept, advantages and limitations of multi-pulse converter. How reduction in harmonics in output voltage can be achieved?	**07**
	(b)	With neat circuit diagram and waveform discuss class E resonant inverter.	**07**
		OR	
Q.3	**(a)**	Discuss various transformer connections for multi-pulse converter.	**07**
	(b)	Discuss series resonant inverter with neat circuit diagram and waveform.	**07**
Q.4	**(a)**	Discuss push pull converter and its application in dc power supply.	**07**
	(b)	With neat circuit diagram explain resonant dc power supply.	**07**
		OR	
Q.4	**(a)**	Draw block diagram of UPS and discuss each block in detailed.	**07**
	(b)	With neat circuit diagram explain resonant ac power supply.	**07**
Q.5	**(a)**	Discuss stepper motor control strategy with appropriate diagram.	**07**
	(b)	Discuss control of brushless dc drive. Give its applications.	**07**
		OR	
Q.5	**(a)**	Discuss energy conversion process in SRM. Give its applications.	**07**
	(b)	What do you mean by electronically commutated motors? Discuss switching circuit of BLDC motor drive.	**07**

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