Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-Vth Examination December 2010

Subject code: 152403 **Subject Name: Applied Power Electronics**

Date: 16 /12 /2010 **Time: 03.00 pm - 05.30 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)**	State various Application areas of Power Electronics. Also list out various applications of Power Electronics in these areas.	**07**
	(b)	What is 'Signal Processing'? What are different functions of signal processing? What is importance of signal processing in Power Electronics?	**07**
Q.2	**(a)**	Explain working of following circuits with neat schematic diagram. Derive input-output relationship. a. Difference Amplifier b. Log Amplifier	**07**
	(b)	Explain working principle of Switched Capacitor Circuit. Draw schematic diagram of switch capacitor realization of resistance. Using switched capacitor circuit, implement inverting amplifier.	**07**
		OR	
	(b)	State various types of Analog to Digital Converters. Explain dual slope integration type ADC with necessary waveforms and schematic diagram. State at least one ADC.	**07**
Q.3	**(a)**	What is a Filter Circuit? What are different Types of Filter Circuits? Draw frequency responses of various filter circuits.	**07**
	(b)	What is PWM? Draw block diagram and explain working of PWM generator. State importance of PWM in Power Processing Circuits.	**07**
		OR	
Q.3	**(a)**	What is PLL? Explain working principle of PLL with neat diagram. State various applications of PLL. Name any one IC chip which can be used in PLL circuit.	**07**
	(b)	Draw schematic diagram of state variable filter. Explain working of the same.	**07**
Q.4	**(a)**	Explain principle of Phase control. With neat diagram explain working of 1-Ø Controlled rectifier.	**07**
	(b)	What is a Motor Drive? Explain with neat diagram. State types of Motor Drives.	**07**
		OR	
Q.4	**(a)**	What is Chopper? Explain basic DC chopper circuit. State types of chopper and explain.	**07**
	(b)	With neat block diagram explain working of speed control of separately excited DC Motor using solid state components.	**07**
Q.5	**(a)**	State types of SMPS. Explain with neat diagram working of buck converter.	**07**
	(b)	What is UPS? Why it is required? State types of UPS. Draw block diagram and explain working of on Line UPS.	**07**
		OR	
Q.5	**(a)**	With neat diagram explain working principle of (1) high frequency fluorescent lighting (2) Induction Heating	**07**
	(b)	What is Simulation? Explain its importance in Power Electronics.	**07**

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