Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER – VII • EXAMINATION – SUMMER 2015

Subject Code: 172407 **Date: 06/05/2015**

Subject Name: Embedded Systems for Power Electronics (Department Elective-I)

Time:02.30pm-05.00pm **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)**	Compare the microprocessor, microcontroller, and single purpose processors and gives their application example based on Power Electronics.	**07**
	(b)	Explain the MAC unit and Watch Dog Timer.	**07**
Q.2	**(a)**	What do you mean by "Task" and "Task state" related to embedded operating systems. Discuss about task control block (TCB) and its data.	**07**
	(b)	Discuss shared data problem. How a semaphore is used to overcome shared data problem.	**07**
		OR	
	(b)	Draw and Explain Memory organization of CIP51 core microcontroller.	**07**
Q.3	**(a)**	What do you mean by preemptive and non-preemptive task? Cite an example.	**07**
	(b)	Describe Timer Special Function registers in details.	**07**
		OR	
Q.3	**(a)**	Give detail of Kernel function in RTOS. Cite an example.	**07**
	(b)	Describe UART Special Function registers in details.	**07**
Q.4	**(a)**	Write a program to generate 8 bit PWM of 20% duty cycle using PCA timer.	**07**
	(b)	Explain CAN bus architecture.	**07**
		OR	
Q.4	**(a)**	Draw and explain RTC interfacing with 8051Microcontroller. Write program to initialized (Write) RTC with Present Date and Time.	**07**
	(b)	Explain I^2C bus architecture.	**07**
Q.5	**(a)**	Write an assembly language program to generate Clock signal with 70% duty cycle on P2.0 using Auto Reload mode. Crystal frequency =12MHz	**07**
	(b)	Write a program to perform the following. 1. Keep monitoring P3.2 until it becomes high. 2. When P3.2 becomes high write value 45H to external memory address 4050H. 3. Sent a high to low pulse to P1.3	**07**
		OR	
Q.5	**(a)**	Write an assembly language program for 8051 to transmit string "Embedded" at 2.4kbps. Crystal frequency =1.8432MHz.	**07**
	(b)	A switch is connected to P1.7. Write a program to check the status of switch and perform the following. 1. if switch = 0, send letter "Y" to P2 2. if switch = 1, send letter "N" to P2.	**07**

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