Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2171005 **Date: 19/11/2018**

Subject Name: Embedded Systems

Time: 10:30 AM TO 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	List out the advantages of ASIC based Embedded Systems.	**03**
	(b)	In absence of Digital to Analog Convertor (DAC), how can you use Pulse Width Modulator for DAC operation?	**04**
	(c)	Explain different approaches for designing and implementing the embedded software.	**07**
Q.2	**(a)**	How Watchdog timer is used in Embedded System design?	**03**
	(b)	Explain the significant differences between Bluetooth and Zigbee protocol.	**04**
	(c)	Explain the differences between programmed I/O, interrupt and direct memory access approaches.	**07**
		OR	
	(c)	What is Device driver? Explain the role of Interrupt in Device driver programming.	**07**
Q.3	**(a)**	Define Interrupt Service Thread with its use in RTOS based system design.	**03**
	(b)	How semaphore helps in handling shared data problems?	**04**
	(c)	Explain the role of TCB in task switching.	**07**
		OR	
Q.3	**(a)**	What will happen if all the tasks are in Wait state? How RTOS will handle such situation?	**03**
	(b)	Describe performance matrices in RTOS based application.	**04**
	(c)	Describe the Timer functions supported in RTOS.	**07**
Q.4	**(a)**	List out significant differences between a soft real time system and a hard real time system.	**03**
	(b)	Describe Deadlock with an example.	**04**
	(c)	Describe the mailbox functions supported in Real Time Operating System.	**07**
		OR	
Q.4	**(a)**	Under which circumstances a task is brought to Wait state?	**03**
	(b)	What are the differences between a function and a task?	**04**
	(c)	Explain following scheduling policies with their differences. (1) Earliest Deadline First (2) Rate Monotonic Scheduler	**07**
Q.5	**(a)**	What are the significant features associated with GPIO in MSP430?	**03**
	(b)	Explain the benefits of using DCO over Crystal in MSP430 based system.	**04**
	(c)	Describe the Watchdog timer operation in MSP430.	**07**
		OR	
Q.5	**(a)**	How MSP430 processor is compiler friendly?	**03**
	(b)	Explain Pin Multiplexing in MSP430.	**04**
	(c)	Describe the Timer operation in MSP430 in association with generation of PWM wave.	**07**

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