Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2171005 **Date:21/01/2021**

Subject Name:Embedded Systems

Time:10:30 AM TO 12:30 PM **Total Marks: 56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Write down the skills required for an Embedded System Designer.	**03**
	(b)	Describe the features associated with AHB and ASB Buses.	**04**
	(c)	Describe an embedded processor as (i) GPP (ii) ASIP (iii) Single purpose processor.	**07**
Q.2	**(a)**	Enlist IO port types with the help of example.	**03**
	(b)	Explain the concept of Multithreading in Real Time Operating System.	**04**
	(c)	Explain the requirements of Software Interrupts (SWI) in Embedded System.	**07**
Q.3	**(a)**	What is Semaphore? Explain where Semaphore can be utilized?	**03**
	(b)	What is the significance of Mailbox in RTOS?	**04**
	(c)	Discuss shared data problems and give solutions to such problems.	**07**
Q.4	**(a)**	Explain difference between level-triggered and edge-triggered interrupts.	**03**
	(b)	Describe the features associated with Bluetooth and Zigbee protocols used in wireless and mobile systems.	**04**
	(c)	Write down methods of saving and optimizing the memory space.	**07**
Q.5	**(a)**	Explain the differences between Hard Real time and Soft Real time system.	**03**
	(b)	Describe the requirement of Direct Memory Access (DMA) based data transfer in Device driver programming.	**04**
	(c)	Write down the functions of Device manager.	**07**
Q.6	**(a)**	Describe Cyclic Scheduling model with an application.	**03**
	(b)	Define following: 1. Deadline 2. Runtime 3. Task Precedence 4. Worst case execution time	**04**
	(c)	Explain any two alternative systems in RTOS for responding to a hardware source calls on the interrupts.	**07**
Q.7	**(a)**	Explain the function of Watchdog timer in MSP430 processor.	**03**
	(b)	Describe the four sources of clock in MSP430 processor.	**04**
	(c)	Explain the use of timer for generating Pulse Width Modulated waveform using MSP430.	**07**
Q.8	**(a)**	Explain the special features associated with GPIO port pins in MSP430 other than simple digital input output port pin characteristics.	**03**
	(b)	Write a program to turn on and off an LED connected to GPIO port pin P1.0 with 1ms delay.	**04**
	(c)	Explain interrupt handling process in MSP430.	**07**

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