Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- VII EXAMINATION-SUMMER 2023

Subject Code: 2171005 Date: 28/06/2023

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define embedded systems. Enumerate examples of embedded systems.	**03**
	(b)	Discuss skills required for an embedded system designer.	**04**
	(c)	Describe the components present on SoC for the design of an embedded system.	**07**
Q.2	**(a)**	How Watchdog timer is used in Embedded System design?	**03**
	(b)	Discuss Real time clock.	**04**
	(c)	List and explain the protocols used for wireless and mobile system communication.	**07**
		OR	
	(c)	Explain the requirements of Software Interrupts (SWI) in software part of an Embedded System.	**07**
Q.3	**(a)**	What is interrupt latency and Deadline?	**03**
	(b)	Discuss Context and the Periods for Context Switching.	**04**
	(c)	Write short note on Direct Memory Access controller.	**07**
		OR	
Q.3	**(a)**	Define Task and Task state.	**03**
	(b)	Discuss Pipe Functions.	**04**
	(c)	What is Semaphore? Explain where Semaphore can be utilized? Describe the functions provided by RTOS to utilize it.	**07**
Q.4	**(a)**	Explain the differences between Hard Real Time and SoftReal Time System.	**03**
	(b)	Describe performance matrices in RTOS based application.	**04**
	(c)	What is the significance of Mailbox in RTOS? Describe the functions provided by RTOS in association with Mailbox.	**07**
		OR	
Q.4	**(a)**	Describe concept of interrupt service thread.	**03**
	(b)	Describe Process management.	**04**
	(c)	Enlist service provided by RTOS and RTOS task scheduling models.	**07**
Q.5	**(a)**	What will happen if all the tasks are in Wait state? How RTOS will handle such situation?	**03**
	(b)	Explain Little-endian and Big-endian ordering.	**04**
	(c)	Explain the clocking system of MSP430.	**07**
		OR	

Q.5	**(a)**	How MSP430 processor is compiler friendly?	**03**
	(b)	What are the benefits of using DCO over Crystal in MSP430 based system.	**04**
	(c)	Draw and Describe the basic architecture and block diagram of MSP430.	**07**

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