GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:2171005   **Date:03/06/2022**
Subject Name:Embedded Systems
Time:02:30 PM TO 05:00 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.**

Q.1	**(a)**	What is embedded system?	**03**
	(b)	Classify embedded systems.	**04**
	(c)	Explain HDLC protocol in detail.	**07**
Q.2	**(a)**	What is synchronous, Iso-synchronous and Asynchronous system?	**03**
	(b)	What is watch dog timer? Explain in brief.	**04**
	(c)	Explain I2C protocol in detail.	**07**
		OR	
	(c)	Give the differences between Functions, ISRs, Tasks, Threads and Process.	**07**
Q.3	**(a)**	What are the situations, which lead to priority inversion problems?	**03**
	(b)	What is real time clock?	**04**
	(c)	Explain the use of "semaphore" with respect to embedded operating systems. List out few semaphore related function which are found on Real Time OS.	**07**
		OR	
Q.3	**(a)**	What is meant by pipe? How does a pipe may differ from queue?	**03**
	(b)	Give an example of deadlock situation during multiprocessing execution.	**04**
	(c)	List different Interrupt Sources. Explain in brief.	**07**
Q.4	**(a)**	What is Spinning lock? Explain the use of it in detail.	**03**
	(b)	What is the importance of device management in an OS for an embedded system?	**04**
	(c)	Discuss Cooperative scheduling Model	**07**
		OR	
Q.4	**(a)**	What are the analogies in a PCB and TCB?	**03**
	(b)	How context switching occurs?	**04**
	(c)	List three ways in which an RTOS handles the Interrupt Routine in multitasking environment. What is the advantage of two or three level handling of interrupts? Explain IST.	**07**
Q.5	**(a)**	What is constant generator register?	**03**
	(b)	What is emulated instruction set? Explain CLR, SETC instructions.	**04**
	(c)	Explain the clock system of MSP430	**07**
		OR	
Q.5	**(a)**	What is Interrupt Latency.	**03**
	(b)	What is DMA? Explain in brief.	**04**
	(c)	List different addressing modes of MSP430. Explain each in detail.	**07**

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