

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024

Subject Code:2171005

Date:28-05-2024

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.

		MARKS
Q.1	(a) Classify an embedded system.	03
	(b) Explain the skills requires for an embedded system designer.	04
	(c) Define synchronous communication and explain SPI protocol with necessary diagram in details.	07
Q.2	(a) Define interrupt latency and deadline.	03
	(b) Classify various sources of interrupts.	04
	(c) Write short notes on DMA controller.	07
OR		
	(c) Explain Wi-fi and ZigBee protocol with necessary diagram.	07
Q.3	(a) Compare reset, power-on reset and watch dog timer.	03
	(b) Describe PCI protocol with necessary diagram.	04
	(c) Compare Preemptive, Non-preemptive and Co-operative scheduling. Also give an example of any one scheduling algorithm.	07
OR		
Q.3	(a) Describe Busy-wait Approach without Interrupt Services Mechanism.	03
	(b) Differentiate between Task and ISR.	04
	(c) Define critical section in an embedded system and explain the Use of binary and counting semaphore with an example.	07
Q.4	(a) Define Real Time Operating System.	03
	(b) Describe the various states of process/task with necessary state diagram.	04
	(c) Explain the Process Management in RTOS along with describing the role of a Timer and Task Control Block.	07
OR		
Q.4	(a) What is shared data problem. Explain the methods to handle shared data problem in an embedded system	03
	(b) Describe in brief about Queue and Mailbox function.	04
	(c) Explain rate-monotonic scheduling algorithm with an example	07
Q.5	(a) Explain the multiplexing scheme associated with port pins of MSP 430	03
	(b) Explain the benefits of using DCO over Crystal in MSP430 based system	04
	(c) Explain the MSP 430 architecture with necessary diagram.	07
OR		
Q.5	(a) Explain the feature associated with GPIO pin of MSP 430	03
	(b) Describe low-power modes of MSP 430.	04
	(c) Write short notes on clock system of MSP 430 with necessary diagram	07
