

GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2024

Subject Code:2171005

Date:07-12-2024

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) Enlist hardware units of an embedded system.	03
(b) What is RTOS? Describe types of RTOS with two examples.	04
(c) Explain different approaches for designing and implementing the embedded software.	07
Q.2 (a) Describe advantage and disadvantage of serial and parallel communication protocol.	03
(b) Explain Watchdog timer.	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) Explain the steps involved during the context switching.	03
(b) Describe interrupt latency and deadline with example.	04
(c) Write short note on DMA controller.	07
OR	
Q.3 (a) What will happen if all the tasks are in Wait state? How RTOS will handle such situation?	03
(b) Explain the feature of device driver and give classification of it.	04
(c) Explain the role of TCB in task switching.	07
Q.4 (a) Explain the differences between Hard Real Time and Soft Real Time System.	03
(b) Describe Deadlock with an example.	04
(c) Write short notes on socket functions.	07
OR	
Q.4 (a) What is Process Control Block? What are the fields included in PCB ?	03
(b) What are the differences between a function and a task?	04
(c) What is the significance of Mailbox in RTOS? Describe the functions provided by RTOS in association with Mailbox.	07
Q.5 (a) Describe the clock system of MSP430 processor	03
(b) Explain the benefits of using DCO over Crystal in MSP430 based system.	04
(c) Write short note on basic architecture of MSP430.	07

OR

- Q.5**
- (a) Describe POR, PUC and BOR for MSP430. **03**
 - (b) Explain the multiplexing scheme in MSP430 processor for the port pins. **04**
 - (c) Describe the Timer operation in MSP430 in association with generation of PWM wave. **07**
