

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3174106

Date:26-11-2025

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 and classify the embedded systems, give few examples of such systems.	03
	(b) Write down the skills required for an Embedded System Designer.	04
	(c) Write a detailed note on Components of embedded System Hardware	07
Q.2	(a) Explain the following terms : 1) IP 2) SoC 3) ASIC	03
	(b) Describe use of Real Time Clock and Watch Dog Timer in Embedded system.	04
	(c) Differentiate between serial and parallel communication. Explain USART & PCI protocol in brief.	07
	OR	
	(c) Compare Wi-Fi, Blue-tooth and Zigbee wireless system protocols in detail.	07
Q.3	(a) Define: Context, Interrupt latency, Interrupt service deadline.	03
	(b) Compare process, task and thread with an appropriate example.	04
	(c) What is Device driver? List it's types and explain any one in detail.	07
	OR	
Q.3	(a) Explain different types of interrupt sources.	03
	(b) What is Semaphore? Explain where Semaphore can be utilized?	04
	(c) Write a detailed note on Interrupt service mechanism.	07
Q.4	(a) Define: Process Control Block. Which data is stored in PCB?	03
	(b) Describe Mailbox function for IPC.	04
	(c) Describe shared data problem with example. How to solve this issue?	07
	OR	
Q.4	(a) What is RTOS ? Describe types of RTOS with two examples.	03
	(b) What is Kernal? Explain Kernal services in RTOS.	04
	(c) Describe co-operative and pre-emptive task scheduling mechanism.	07
Q.5	(a) Explain Earliest Deadline First Mechanism in brief.	03
	(b) Describe the four sources of clock in MSP430 processor	04
	(c) Sketch interfacing diagram to interface 8 LEDs with MSP430. Turn-ON LEDs in ring counter fashion.	07

OR

- | | | |
|------------|---|-----------|
| Q.5 | (a) Sketch Register Organization of MSP430 | 03 |
| | (b) Explain low-power modes of MSP430. | 04 |
| | (c) Explain MSP430 timer modes available for Timer-A. Write C-Program for MSP430 to generate 1KHz square wave on pin P1.0 using Timer-A. | 07 |
