

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VII EXAMINATION – SUMMER 2026****Subject Code:3174106****Date:03-06-2026****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) List down the criteria for choosing CPU for any embedded application.	03
	(b) Enlist hardware units of an embedded system.	04
	(c) Describe the features associated with Bluetooth and Zigbee Protocols used in wireless and mobile systems.	07
Q.2	(a) Explain Watchdog timer.	03
	(b) What is RTOS ? Describe types of RTOS with two examples.	04
	(c) Describe I2C and CAN bus protocol.	07
	OR	
	(c) Compare serial and parallel communication. Explain the buses used for serial communication.	07
Q.3	(a) Explain difference between level-triggered and edge-triggered interrupts.	03
	(b) Explain UART protocol for serial communication.	04
	(c) Explain I ² C bus communication protocol with necessary diagram.	07
	OR	
Q.3	(a) Explain the steps involved during the context switching.	03
	(b) Define interrupt latency and deadline.	04
	(c) Explain interrupt and interrupt service routine concept with an example.	07
Q.4	(a) Differentiate : Function and ISR	03
	(b) Explain concept of Semaphores.	04
	(c) Discuss characteristics of the functions; interrupt service routines (ISRs) and task.	07
	OR	
Q.4	(a) Enlist RTOS task scheduling models.	03
	(b) Enlist service provided by RTOS.	04
	(c) Describe dead-lock condition. Write pseudo code for deadlock utilizing mutex M1 and M2 shared between two processes P1 and P2.	07
Q.5	(a) Describe the clock system of MSP430 processor.	03
	(b) Explain Direct Memory Access controller with necessary diagram.	04
	(c) Explain MSP430 RISC CPU architecture.	07
	OR	
Q.5	(a) List at least three operating system services.	03
	(b) Explain pin multiplexing in MSP430.	04
	(c) Write short notes on socket functions.	07
