

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - V EXAMINATION - WINTER 2025

Subject Code: N115AO02

Date: 08-12-2025

Subject Name: Microprocessor and Embedded System

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) List applications of embedded systems in robotics.	03
(b) Draw and explain the block diagram of a basic embedded system.	04
(c) Explain embedded system design flow with example.	07
Q.2 (a) What is segmentation? List the various segment registers in 8086 and explain their role.	03
(b) Explain Arithmetic instruction of 8086 with example.	04
(c) Explain 8086 microprocessor architecture with neat block diagram.	07
OR	
(c) Write Assembly language program to find minimum number among four 16-bit numbers in the 8086 microprocessor.	07
Q.3 (a) Write an 8086 program to find the sum of first 10 natural numbers.	03
(b) Explain flag register of 8086 microprocessor.	04
(c) Interface 2 line, 16 character LCD display to 8051/8951 using only one port. Write assembly language program to display message “HELLO” on line 2 of LCD.	07
OR	
(a) Explain the difference between hardware and software interrupts.	03
(b) Explain interfacing of relay with 8051 microcontroller.	04
(c) Write a program to generate square wave of 50% duty cycle having frequency 5 KHz at port pin P3.4 using timer 0 in mode 2. XTALMZ = 18.432 MHZ	07
Q.4 (a) Differentiate between serial and parallel data communication.	03
(b) Explain steps performed by 8051 during execution of interrupt	04
(c) Explain in detail the structure and operation of port P0 of the 8051 microcontroller.	07
OR	
(a) Why ‘C’ programming is preferred as compared to assembly programming.	03

(b) Differentiate between 1) SJMP & LJMP 2) RET & RETI **04**

(c) What are the interrupts available in the 8051 microcontroller? Explain interrupt enable (IE) SFR and Interrupt priority (IP) SFR. **07**

Q.5 (a) What is Embedded C? State any two advantages. **03**

(b) Explain scheduling policies in RTOS. **04**

(c) Explain the architecture of ARM processor with neat block diagram. **07**

OR

(a) What is Unified Modeling Language (UML) and why is it used in embedded design? **03**

(b) Explain priority inversion in RTOS with an example. **04**

(c) Discuss Real-Time Operating System (RTOS) services and explain their role in multitasking. **07**
