

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII EXAMINATION – WINTER 2025****Subject Code:3172001****Date:26-11-2025****Subject Name:Microcontrollers and 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) Compare Von-Neuman vs Harvard architecture	03
	(b) Explain PSW in microcontroller with suitable diagram.	04
	(c) Define embedded systems and give examples. Draw block diagram of a generalized embedded system.	07
Q.2	(a) Differentiate between interrupts and polling.	03
	(b) Define checksum byte. How is checksum operation performed?	04
	(c) Explain architecture block diagram of 8051.	07
	OR	
	(c) Explain memory organization in 8051 microcontroller.	07
Q.3	(a) What is ALU and ALE? Explain in brief.	03
	(b) Draw the internal structure of PORT1 of 8051 microcontroller.	04
	(c) WAP in C to display a count of 0 to 9 on 7-segment display with delay of 0.5seconds. XTAL=12MHz.	07
	OR	
Q.3	(a) Explain RS-232 interfacing to Atmel 8051.	03
	(b) Give the bit pattern of TCON register in the 8051 and explain significance of each bit.	04
	(c) List various types of addressing modes of microcontroller and explain them in detail.	07
Q.4	(a) State different types of buses and their functions in PIC18F4xx.	03
	(b) Explain H-bridge concept for DC motor control.	04
	(c) Interface 7-segment display with PIC18F4xx.	07
	OR	
Q.4	(a) Explain arithmetic operation in PIC18F Family.	03
	(b) How do you control speed of DC motor using PWM?	04
	(c) Draw and explain pipeline in PIC18F4xx in detail.	07
Q.5	(a) Draw and explain internal structure of PORTB of PIC18F4xx.	03
	(b) For PIC18F4xx microcontroller, explain PUSH & POP instructions with a programming example.	04
	(c) Explain the interfacing of the stepper motor with the microcontroller.	07

OR

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| Q.5 | (a) | State & explain any 3 machine control instructions. | 03 |
| | (b) | Explain the significance of stack and stack pointer register. | 04 |
| | (c) | Write an Assembly language program to move a memory block of 10 bytes stored at address starting from 0x100 to 0x200. | 07 |
