

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- V EXAMINATION – SUMMER 2026****Subject Code:3150306****Date:06-06-2026****Subject Name: Microcontroller Programming & Interfacing****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) Draw the pin diagram of 8051.	03
	(b) Explain the role of microcontroller in embedded systems.	04
	(c) Draw and explain architecture of 8051 microcontroller.	07
Q.2	(a) Explain the difference between Microprocessor and microcontroller.	03
	(b) Explain PSW SFR in detail.	04
	(c) Draw and Explain memory structure of 8051.	07
	OR	
	(c) Explain in detail the structure and operation of PORT P0 and PORT P1 of the 8051 microcontroller.	07
Q.3	(a) Enlist and explain any 6 arithmetic or logical instructions.	03
	(b) Swap the nibble of external RAM location 5500h.	04
	(c) Set the bit D0 of RAM location 1Fh if the number in R0 > 20.	07
	OR	
Q.3	(a) Enlist and explain any 6 Jump or Call instructions.	03
	(b) Put a random number in R2 and decrement it until it equals 02h.	04
	(c) Number F0h is placed somewhere in external RAM between locations 0001h and 0F00h. Find the address of that location and put that address in R0 (LSB) and R1 (MSB).	07
Q.4	(a) Draw the pin diagram of ATMEGA32.	03
	(b) Write a c program to turn ON 8 leds while switch is pressed and otherwise turn off all leds. Leds are connected to PORT C and switch is connected to PIN Port B.0.	04
	(c) Enlist and explain different SFRs used for timer programming using ATMEGA32 controller.	07
	OR	
Q.4	(a) Write a c program to blink led 50 times using ATMEGA32.Led is connected to PORTD.0.	03
	(b) Enlist different SFRs used for Serial communication programming using ATMEGA32 and explain any one in detail.	04
	(c) Draw and explain the architecture of ATMEGA32.	07
Q.5	(a) Draw and explain the interfacing of Relay with ATMEGA32.	03
	(b) Write a C Program to toggle only the PORTD.2 bit continuously every 4ms. Use Timer1, Normal Mode, and No prescaler. Assume XTAL – 8 MHz.	04
	(c) Write a c program read analog signal and display output on PORTC and PORTD using Leds.	07

OR

- Q.5**
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|------------|---|-----------|
| (a) | Draw and explain the interfacing of Optoisolator with ATMEGA32. | 03 |
| (b) | Write a c program to toggle bit of PORTB continuously with some delay using Timer 0, Normal Mode and No Prescaler. Assume XTAL = 8 MHz. | 04 |
| (c) | Interface Keypad and LCD to ATMEGA32 and Write a C program to read the keypad and display the result (ASCII value of key pressed) on LCD. | 07 |
