Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code: 3160914 Date: 20-05-2025

Subject Name: Microprocessors and Microcontrollers

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 T-state, machine cycle and instruction cycle. Draw the timing diagram for the 8085 instruction IN AA h.	**03**
	(b)	What are Tri-state devices and why are they essential in a bus oriented system?	**04**
	(c)	Draw and Explain the functional block diagram 0f 8085.	**07**
Q.2	**(a)**	Explain following pins of 8085. (i) ALE (ii) SOD (iii) TRAP	**03**
	(b)	Differentiate between following instructions of 8051. (i) RET & RETI (ii) MOVX & MOVC	**04**
	(c)	Discuss the internal RAM structure of 8051. Explain SFR space in detail.	**07**
		OR	
	(c)	Write a 8051 C program to generate a delay of 1 ms using timer0 in Mode1. Utilize this delay routine to blink LED connected at pin number 0 of Port P_2 with a ON time of 1 sec and OFF time of 1 sec. Assume crystal frequency to be 11.0592 MHz.	**07**
Q.3	**(a)**	Differentiate between PUSH and POP operation for 8051.	**03**
	(b)	Explain the role of TCON & SCON registers in 8051.	**04**
	(c)	Write advantage of embedded C programming over assembly language. Discuss the data types used in 8051 embedded C language.	**07**
		OR	
Q.3	**(a)**	Draw & explain the physical port structure of port P_3 of 8051.	**03**
	(b)	List out the various interrupt in 8051 μc. How the default priority of an interrupt can be changed?	**04**
	(c)	Write 8051 assembly language program to exchange a number stored at external memory location 2000h with number stored at external memory location 2001h.	**07**
Q.4	**(a)**	Discuss the auto-reload Mode2 of timers in 8051. What are the advantages of this mode?	**03**
	(b)	Explain any two bit wise instructions of 8051 with suitable example.	**04**
	(c)	Define baud rate for serial communication in 8051 μc. Explain Mode0 and Mode1 for serial communication in 8051 μc.	**07**
		OR	
Q.4	**(a)**	Explain IE register in brief.	**03**
	(b)	Write the bit configuration of PCON register of 8051. Also explain function of each bit.	**04**
	(c)	Compare the difference between the ARM and 8051 μc. Also state various applications of ARM microcontroller.	**07**

Q.5	**(a)**	Draw and explain each bit of current program status register of ARM processor.	**03**
	(b)	Discuss how stepper motor can be interfaced with 8051 using detailed block diagram.	**04**
	(c)	Discuss the interfacing of ADC 0808 and 8051 with detailed schematic diagram.	**07**

OR

Q.5	**(a)**	Draw a diagram of 4*4 Matrix keyboard interfacing with 8051.	**03**
	(b)	Draw an interfacing of 8051 with 16 K of external RAM.	**04**
	(c)	Draw and explain an interfacing of 4 digit seven segment display with 8051.	**07**

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