Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:3160914 Date:02-12-2023

Subject Name:Microprocessors and Microcontrollers

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)**	Explain basic differences between CISC and RISC processor.	**03**
	(b)	Write one instruction each using the following addressing modes. a. Immediate b. Register c. Register indirect d. Direct	**04**
	(c)	Draw the block diagram of 8051 microcontroller. Explain the working of a) Stack and Stack pointer b) Program Counter and Data Pointer.	**07**
Q.2	**(a)**	Explain the following Pin function of 8051 microcontroller. 1) RXD 2) PSEN 3)ALE	**03**
	(b)	Compare MOVX and MOVC instructions.	**04**
	(c)	Briefly explain the JMP & CALL instruction available in 8051.	**07**
		OR	
	(c)	Write an assembly program to add 10 bytes in external RAM location 4000H.Store the result at external memory location 3000H	**07**
Q.3	**(a)**	What is the function of the bits TMOD.1 & TMOD.2?	**03**
	(b)	Explain the Timer in Mode 0 in 8051.	**04**
	(c)	Write an 8051 C program to toggle all the bits of port 0 continuously. Use timer 0 to generate 10 sec between each toggle.	**07**
		OR	
Q.3	**(a)**	Find out the Hex number to be loaded in Timer 0 to produce delay of 4.096ms in mode 0 operation.Assume clock frequency of 12MHz.	**03**
	(b)	Explain TCON Register for 8051 Microcontroller	**04**
	(c)	Write an assembly language program to generate square wave at 10 KHz frequency with timer 0 with mode 2 on Port pin P0.1.	**07**
Q.4	**(a)**	What is the function of SBUF register in 8051?	**03**

	(b)	Explain how interrupt priority can be changed using IP register. Also explain the default priorities assigned to interrupts in 8051 microcontroller.	**04**
	(c)	Write an 8051 program to transfer WELCOME serially at 9600 baud rate(8 bit data and 1 stop bit) continuously.	**07**
		OR	
Q.4	**(a)**	Explain the bit contents of IE register.	**03**
	(b)	Give comparison between Asynchronous and Synchronous serial data transfer	**04**
	(c)	Explain SCON register in 8051 microcontroller.	**07**
Q.5	**(a)**	Draw and explain 8051 connection to external RAM (8K x 8)	**03**
	(b)	List the features of ADC 0804	**04**
	(c)	Interface a DAC to 8051 microcontroller and write an assembly language program to generate triangular wave using DAC interface.	**07**
		OR	
Q.5	**(a)**	List the vector addresses of various interrupts in ARM processor.	**03**
	(b)	Draw an interfacing diagram to interface 4 x 4 matrix keyboard with 8051.	**04**
	(c)	Discuss how the speed and direction of DC motor can be controlled using microcontroller.	**07**

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