Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160914 Date:15-05-2024

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)**	State the size of address and data bus in 8085. Explain how they are multiplexed?	**03**
	(b)	State the difference between Van Neumann and Harvard architecture	**04**
	(c)	Draw and discuss the timing diagram of MVI instruction of 8085 microprocessor	**07**
Q.2	**(a)**	Answer the following: (i) Which port in 8051 cannot be used for any dual function? (ii) Give the names of hardware and software interrupts of 8051. (iii) How much RAM and ROM is available internally in 8051?	**03**
	(b)	Give the function of the following pins of 8051. (i) TXD (ii) EA	**04**
	(c)	Draw and explain architectural block diagram of 8051	**07**
		OR	
	(c)	Write an ALP to separate out positive, negative and zero numbers in an array in external memory starting from 3000H. The array is 10 bytes long. Store the count of positive, negative and zero numbers in internal RAM location 30H, 31H and 32H	**07**
Q.3	**(a)**	It is required to select register bank 3 in 8051. Explain how it can be done?	**03**
	(b)	If A = $(17)_{10}$ and B = 3, what will be the data in registers A and B when the following instructions are executed (i) MUL AB (ii) DIV AB. What will be status of OV flag in both the cases?	**04**
	(c)	Draw and explain the internal structure of P0 and P1 in 8051	**07**
		OR	
Q.3	**(a)**	Draw the internal RAM structure of 8051	**03**
	(b)	Explain the following instructions of 8015 giving examples	**04**

(i) CJNE (ii) XRL

	(c)	Draw and explain the format of TCON and TMOD register. State the function of each and every bit	**07**

Q.4	**(a)**	Assume that Timer 1 is operating in mode 2 and the count loaded in timer is F3H. After how much time, timer overflow flag TF1 will get set? Assume XTAL = 10 MHz	**03**
	(b)	Write an 8051 C program to toggle all the pins of port 1 continuously with some delay	**04**
	(c)	Write an assembly language program to transmit the message "GTU" serially at 9600 baud, 8 bit data, 1 stop bit. Do this continuously	**07**

OR

Q.4	**(a)**	Explain SCON and SBUF registers of 8051	**03**
	(b)	Write an 8051 C program to toggle pin P1.5 every 50 ms. Use XTAL = 11.0592 MHz. Use Timer 0 in mode 1 to generate the delay	**04**
	(c)	Explain IE and IP registers of 8051. State the priorities of interrupts. If IP contains 08H, will the default priorities change? Discuss.	**07**

Q.5	**(a)**	How many general-purpose registers are available in ARM in user mode? Also explain the function of SP, PC and LR registers in ARM.	**03**
	(b)	Draw how 4 × 4 matrix keyboard is interfaced with 8051	**04**
	(c)	Explain how LCD can be interfaced with 8051? Discuss the commands that are required to be given to initialize the LCD. Write an ALP to display "YES" on first line of LCD	**07**

OR

Q.5	**(a)**	Explain the difference between RET and RETI instruction	**03**
	(b)	Explain CPSR format in ARM	**04**
	(c)	Explain how external 8K ROM can be interfaced with 8051? Draw the connection diagram. Also discuss the function of ALE signal.	**07**

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