GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3160914   **Date:20-11-2024**
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)**	State the difference between RISC and CISC architecture	**3**
	(b)	What is the size of address and data bus in 8085? Are they unidirectional or bidirectional? Show, how a 2K memory can be interfaced with 8085?	**4**
	(c)	Draw and explain architectural block diagram of 8085 microprocessor	**7**
Q.2	**(a)**	Give the function of RS0 and RS1 bits in PSW register of 8051	**3**
	(b)	State the significance of PC and DPTR register of 8051	**4**
	(c)	Draw and explain timing diagram of MVI instruction of 8085 microprocessor	**7**
		OR	
	(c)	Draw and explain the internal RAM structure of 8051. Show register banks and bit addressable area of 8051	**7**
Q.3	**(a)**	Explain the function of the following pins in 8051 (i) INT0 (ii) RXD (iii) EA	**3**
	(b)	Explain the following instructions of 8051 giving appropriate examples (i) CJNE (ii) JBC	**4**
	(c)	Discuss the different types of bit manipulation instructions available with 8051	**7**
		OR	
Q.3	**(a)**	Write an ALP to divide the data in RAM location 3FH by the number 12. Put the quotient in R4 and remainder in R5.	**3**
	(b)	Write an ALP to subtract the contents of register R2 from the number F3H and put the result in external RAM location 5678H	**4**
	(c)	With the help of appropriate examples, discuss the different types of rotate instructions available with 8051	**7**
Q.4	**(a)**	A certain instruction requires two machine cycles for execution. If the clock frequency is 11.0592 MHz determine the time required to execute the instruction	**3**
	(b)	What is the significance of GATE bit in TMOD register?	**4**
	(c)	Give the format of TCON register and explain the function of each bit.	**7**
		OR	
Q.4	**(a)**	Give difference between simplex, half duplex and full duplex transmission	**3**
	(b)	Write an assembly language program for 8051 to transfer the letter "A" serially at 4800 baud continuously. Assume XTAL = 11.0592 MHz	**4**

(c) Write a C program to alternately display 55H and AAH on P1 port with some delay **7**

Q.5 **(a)** Give interrupt vector table of 8051. Discuss their priorities **3**
(b) Discuss the format of IE register and explain the function of each bit **4**
(c) Draw and explain how 8051 can be connected to external 8K RAM. Which ports are used for address and data lines? **7**

OR

Q.5 **(a)** What is meant by pipelining? How it affects execution speed? **3**
(b) Discuss the format CPSR register in ARM. State the different operating modes of the processor. **4**
(c) What is stepper motor? State some of its applications. Draw and discuss how 8051 can be interfaced with stepper motor? **7**

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