GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– VI (NEW) EXAMINATION – WINTER 2021

Subject Code:3160914   **Date:24/11/2021**

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)**	**Fill in the following blanks:**	**03**
		(1) The first operation performed by the microprocessor during execution of each instruction is _____.	
		(2) If the memory chip size is (512 x 8), the number of chips required in making 4K-byte memory is _____.	
		(3) The addressing mode of MOV A, 30H instruction is _____.	
	(b)	Explain functions of following pins of 8085: (i) IO/M (ii) READY	**04**
	(c)	Draw and explain timing diagram of STA 5000H instruction of 8085.	**07**
Q.2	**(a)**	With the help of diagram show how de-multiplexing of address/data lines AD0- AD7 can be achieved?	**03**
	(b)	Draw and explain Port-2 architecture of 8051.	**04**
	(c)	Write an assembly language program that transfers a set of ten 8-bit numbers stored in external RAM starting from 1000H to internal RAM starting from 40H. Also, draw flowchart for the program logic.	**07**
		OR	
	(c)	Draw an interfacing scheme to interface 16K EPROM and 8K RAM with 8031. Also specify address range.	**07**

Q.3	**(a)**	Write an output after execution of each of the following set of instructions in sequence:
		MOV A, #36H
		SWAP A
		ANL A, #0FH
		MOV P0,A
			03

	(b)	Explain register banks of 8051. How banks can be selected?	**04**
	(c)	Write a subroutine that converts Hex digit into its equivalent ASCII and hence using it write a program to convert an 8-bit Hexadecimal number available in RAM at 30H into its equivalent ASCII and store the result in RAM at 40H and 41H.	**07**
		OR	
Q.3	**(a)**	Draw and explain Reset circuit of 8051.	**03**
	(b)	Explain addressing modes of 8051 with example.	**04**
	(c)	A push button switch is connected with P3.2 pin of 8051 that normally pull the pin high and when pressed, the level on pin become low. Write a program that makes an emergency alarm connected with P1.0 pin ON when the switch is pressed. The alarm should automatically goes OFF after 30 second.	**07**

Q.4	**(a)**	Explain IE register of 8051.	**03**
	(b)	Explain 8051 interrupt's priority. How the priority can be modified?	**04**
	(c)	Write a 'c' program that generates a square wave of 1 KHz frequency on P1.0 pin using timer-0 in mode-1. Show timer count calculation.	**07**

OR

Q.4	**(a)**	Differentiate between MOVX and MOVC instruction.	**03**
	(b)	Draw an interfacing scheme to interface (20X2) LCD display with 8051 microcontroller.	**04**
	(c)	Write an embedded 'C' program that displays a message "Happy New Year" in line-1 and "2021" in line-2 of LCD display.	**07**
Q.5	**(a)**	Explain SCON register of 8051.	**03**
	(b)	Draw an interfacing scheme to interface ADC0809 with 8051.	**04**
	(c)	Write a program that transmits a message "Happy New Year" using serial mode-1 at 9600 baudrate. Assume oscillator frequency =11.0592 MHz. Show timer count calculation for the specified baudrate.	**07**

OR

Q.5	**(a)**	Draw an interfacing scheme to interface 4 x 4 matrix keyboard with 8051.	**03**
	(b)	Draw an interfacing scheme to interface 4-digit common cathode seven segment display with 8051.	**04**
	(c)	Using interfacing scheme in part-b, write an embedded 'C' program that updates and displays real time second and minute on 4-digit common cathode seven segment display.	**07**

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