GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– V (New) EXAMINATION – WINTER 2019

Subject Code: 2151707   **Date: 25/11/2019**

Subject Name: Microcontroller & Interfacing (IC)

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.

			MARKS
Q.1	**(a)**	Define 1) T- state, 2) Machine cycle, 3) Instruction cycle.	**03**
	(b)	Illustrate with the help of a neat sketch the steps of data flow when the instruction code 4FH stored in memory location 3000H is fetched.	**04**
	(c)	What is a flag? How many flags are present in 8051 microcontroller and where are they located? Explain the PSW with the help of neat diagram.	**07**

Q.2	**(a)**	Find the CY and AC flag bits after executing the following code.
		MOV A,#0FFH
		ADD A,#01H.
			03

	(b)	Explain DB & END assembler directives of 8051 microcontroller.	**04**
	(c)	Interface the following memories with 8085: (i) 8K EPROM (ii) 4K RAM. Also give the address range for both the memories.	**07**
		OR	
	(c)	Explain internal configuration and working of port 0 with the help of neat diagram.	**07**
Q.3	**(a)**	Explain the difference between Jump and Call instructions.	**03**
	(b)	Explain the timer/counter control logic in 8051 with a neat sketch.	**04**
	(c)	Write an ALP to toggle the bits of P0, P1 and P2 every ¼ second. (crystal frequency = 11.0592 MHz)	**07**
		OR	
Q.3	**(a)**	Which bank conflicts with the stack in 8051 microcontroller? How this conflict can be resolved?	**03**
	(b)	Explain the function of pin no 29, 30, 31 & 32 of 8051 microcontroller.	**04**
	(c)	Write an ALP to generate a square wave of 50Hz frequency on bit 3 of port 2.	**07**
Q.4	**(a)**	Write code to push R0, R1 and R2 of bank 0 onto the stack and pop them back into R5, R6 and R7 of bank 3.	**03**
	(b)	Draw the bit pattern of TCON register and explain each bit.	**04**
	(c)	Draw interfacing circuit of LCD with microcontroller 8051. Explain the function of each pin of LCD.	**07**
		OR	
Q.4	**(a)**	Write a program to bring in a byte of data serially one bit at a time via pin P2.1 and save it in register R1. The byte comes in with LSB first.	**03**
	(b)	Draw the bit pattern of SCON register and explain each bit.	**04**
	(c)	Show 8051 connections with 4x4 Matrix Keyboard. Explain with the help of flow chart the logic to identify the key pressed.	**07**
Q.5	**(a)**	Explain the different types of serial communication.	**03**

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(b) A door sensor is connected to the P1.1 pin and a buzzer is connected to P1.7. Write an 8051 C program to monitor the door sensor and when it opens, sound the buzzer. **04**

(c) Interface stepper motor and one switch with microcontroller 8051. Write an assembly or C program to rotate it in clockwise if switch is pressed else rotate it in anticlockwise direction. **07**

OR

Q.5 (a) How many interrupts are available in 8051 microcontroller? Enlist them with their ROM locations. **03**

(b) Write an 8051 C program to get the status of bit P1.0. Save the bit and send it to P2.7 continuously. **04**

(c) Show 8051 connections with DAC – 0808. Write an assembly or C-program to generate a sine wave using the same. **07**

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