GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER- V EXAMINATION-SUMMER 2023
Subject Code: 2150306   **Date: 22/06/2023**
Subject Name: Microcontroller & Interfacing (Biomedical)
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.**

Q.1	**(a)**	Give the differences between microprocessors and microcontrollers.	**03**
	(b)	Draw the pin diagram of 8051 microcontroller.	**04**
	(c)	Draw and explain internal block diagram of 8051 microcontroller. Explain PORTs of 8051.	**07**
Q.2	**(a)**	Explain program counter and stack pointer.	**03**
	(b)	Draw and Explain PSW register.	**04**
	(c)	Explain memory structure of 8051 microcontroller.	**07**
		OR	
	(c)	Explain different addressing modes of 8051.	**07**
Q.3	**(a)**	Explain the instructions of 8051 with examples: ANL, CLR, CPL	**03**
	(b)	Explain for loop and while loop of c language using example.	**04**
	(c)	Explain any 3 arithmetic instructions of 8051. Write an assembly program to "AND" the contents of external RAM location 2000h and 2001h. Store the result in external RAM location 3000h.	**07**
		OR	
Q.3	**(a)**	Explain any 3 CALL instructions.	**03**
	(b)	Write an assembly or c code to blink led which is connected to Port 1.0 of 8051.	**04**
	(c)	Explain different Rotate instructions of 8051. Divide the number in R1 by 2 and put the quotient in R0 and reminder in R2.	**07**
Q.4	**(a)**	A door sensor is connected to the pin P2.1, and a buzzer is connected to P2.7. Write an 8051 assembly or C program to monitor the door sensor. When it opens, sound the buzzer.	**03**
	(b)	Write an 8051 C program to receive bytes of data serially and put them in P1. Set the baud rate at 4800, 8-bit data, and 1-stop bit.	**04**
	(c)	Write an Assembly or C code to display your name on LCD using 8051.	**07**
		OR	
Q.4	**(a)**	Draw and explain Relay interfacing using 8051.	**03**
	(b)	Write a c code to display "5" on Common Anode seven segment using 8051.	**04**
	(c)	Write a program to transfer a letter 'X' serially at 9600 baud rate continuously.	**07**
Q.5	**(a)**	Explain IE (Interrupt Enable) Register and IP register of 8051.	**03**
	(b)	Draw and explain DC motor Interfacing with 8051 in detail.	**04**
	(c)	Write a program to generate 1 KHz pulse waveform of 10% duty cycle on pin 1.0 using timer-1.	**07**
		OR	
Q.5	**(a)**	Draw and explain the block diagram of Timer 0.	**03**
	(b)	Enlist different SFRs used in Timer 0 programming. Explain any 3 in detail.	**04**
	(c)	Write an assembly or C code to read analog sensor value using ADC 0808 and 8051.	**07**

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