Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2017

Subject Code: 2150907 Date: 08/11/2017

Subject Name: Microprocessor and Microcontroller Architechture & Interfacing

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)**	Draw programming model of 8085 microprocessor and explain flag register in brief.	**03**
	(b)	Illustrate control signal generation and de-multiplexing of AD0-AD7 with suitable diagram.	**04**
	(c)	Draw the timing diagram of instruction OUT 80H. (Hex Code: D3H)	**07**
Q.2	**(a)**	Write addressing modes of 8051 microcontroller with one instruction of each addressing mode.	**03**
	(b)	Explain internal RAM structure of 8051 microcontroller in brief.	**04**
	(c)	What is the maximum size of memory that can be connected with 8031 microcontroller? Design a memory interfacing scheme for interfacing of 16KB Data RAM with 8031 microcontroller. Also write its memory map.	**07**
		OR	
	(c)	Write a program to convert a HEX number stored at memory location 30H into unpacked BCD and store result from memory locations 40H onwards.	**07**
Q.3	**(a)**	What is the minimum & maximum frequency of square wave that can be generated at any port of 8051 microcontroller using crystal frequency of 12MHz?	**03**
	(b)	Briefly describe the bit format of TMOD & TCON registers.	**04**
	(c)	Write a program to generate a square wave of 50Hz frequency at P2.0 using Timer 1 in Mode 1 with standard crystal frequency.	**07**
		OR	
Q.3	**(a)**	Explain Mode 2 operation of timers in 8051 microcontroller.	**03**
	(b)	What is the use of Gate bit in TMOD register? Explain it with suitable diagram.	**04**
	(c)	Write a program to generate a square wave of 10KHz frequency at P2.2 using Timer 1 in Mode 2 with standard crystal frequency.	**07**
Q.4	**(a)**	How baud rate can be set in 8051 microcontroller for serial communication?	**03**
	(b)	Write data types available in embedded C.	**04**
	(c)	Write a C program to display “NATIONAL ROBOCON” on PC with a baud rate of 9600 bps using serial communication in 8051.	**07**
		OR	
Q.4	**(a)**	What is interrupt? Write all interrupts of 8051 microcontroller according to their priority level and vector address.	**03**
	(b)	Draw bit pattern of IE register and explain interrupt enable process with suitable diagram.	**04**

	(c)	Write a C program to receive the data serially from the personal computer and send it to Port 1 continuously at a baud rate of 9600 bps.	**07**
Q.5	**(a)**	Draw interfacing diagram for interfacing of DC motor using H-bridge circuit with 8051 microcontroller and also connect a switch at P2.1.	**03**
	(b)	For the interfacing diagram in (a), write a program to rotate DC motor in clockwise direction if switch is ON and in anti-clockwise direction if the switch is OFF.	**04**
	(c)	Explain the interfacing of 20 X 2 LCD with 8051 microcontroller and write a program to display "HELLO" on it.	**07**

OR

Q.5	**(a)**	Write difference between Van Neumann & Harvard architecture.	**03**
	(b)	Draw the interfacing diagram to interface ADC 0808 with 8051 microcontroller. Write the steps in brief for Analog to Digital conversion.	**04**
	(c)	Using interfacing scheme in part (b), write a program to read Channel 2 from ADC and send the digital data to Port 3 continuously.	**07**

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