Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2016

Subject Code:2151707 **Date:21/05/2016**

Subject Name:Microcontroller & Interfacing (IC)

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. **Consider crystal frequency of 12MHz for microcontroller 8051 if not specified.**
5. **Comment lines are must in assembly and C programs.**
4.

Q.1	**(a)**	Interface 8 SPST switches (number 0 to 7) to port 1 and seven segment common anode display to port 2. Write an 8051 assembly language program to display the number of switch which is pressed at a time on seven segment display.	**07**
	(b)	Write an 8051 C program to toggle LED connected to port P2.2 every 500 msec. Stop toggling after 15000 such toggles (on-off means one toggle).	**07**
Q.2	**(a)**	Two 16 bit BCD numbers are stored in registers R0 (LSB)-R1 and R2 (LSB)-R3. Add these numbers and store the BCD result in external RAM 2000H (LSB) onwards.	**07**
	(b)	List different addressing modes of microcontroller and explain each of them with appropriate example.	**07**
		OR	
	(b)	(i) Discuss various C data types for the 8051 microcontroller.	**04**
		(ii) Draw circuit diagram of XTAL connection and power on RESET circuits for the 8051 microcontroller.	**03**
Q.3	**(a)**	Write an 8051 assembly language program to generate a square wave of 50Hz, 25% duty cycle on the P1.7 pin using timer 0. Show your delay calculations assuming crystal frequency of 12MHz.	**07**
	(b)	Write an 8051 assembly language program to toggle LED every 500 msec, which is connected to pin P1.5. Use timer 1 interrupt in your program. (No credit/mark will be given without interrupt)	**07**
		OR	
Q.3	**(a)**	Write a C program for 8051 to transmit the message "GTU" serially at 4800 baud rate continuously using 8-bit data and 1 stop bit.	**07**
	(b)	Connect a switch to INT0 interrupt pin and LED to P1.3 of microcontroller 8051. Write an assembly language program to toggle LED when switch is not pressed. Stop the toggling and put LED in ON status if switch is pressed. Keep this continuously. Make use of interrupt in your program. (No credit will be given without interrupt)	**07**
Q.4		Draw interfacing circuit of LCD with microcontroller 8051. Explain the function of each pin and register of LCD. Write an 8051 C program to display message "CLEAN INDIA" on LCD using busy flag method.	**14**
		OR	

Q.4		Interface 4x4 matrix keyboard with 8051 microcontroller. Draw flowchart and write an assembly language program to detect the pressed key and store its corresponding ASCII value in external RAM location 3000H.	**14**
Q.5	**(a)**	Interface 8255 with microcontroller 8051 in which port A address is 3000H. What are the addresses of other ports in your interfacing? Write an 8051 assembly language program to get data from port A and display its complement on port B.	**07**
	(b)	Draw and explain timing diagram of MOV C, A instruction of microprocessor 8085.	**07**

OR

Q.5	**(a)**	Interface stepper motor and one switch with microcontroller 8051. Write an assembly or C program to rotate it in clockwise if switch is pressed (i.e. 1), else rotate it in anticlockwise direction.	**07**
	(b)	What is the need of demultiplexing in microprocessor 8085? With the help of neat diagram explain the same in detail.	**07**

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