Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – V (NEW) EXAMINATION – WINTER 2015

Subject Code: 2151707 **Date:17/12/ 2015**

Subject Name: Microcontroller & Interfacing

Time:10:30am to 1:00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Compare the following:	
		(i) Microprocessor and Microcontroller	**04**
		(ii) Absolute address decoding and Partial address decoding	**03**
	(b)	(i) Define: T-state, Machine cycle and Instruction cycle.	**03**
		(ii) Explain with neat sketch how lower order address is demultiplexed in 8085.	**04**
Q.2	**(a)**	Interface the following memories with 8085: (i) 2K EPROM (ii) 2K RAM. The EPROM address should start from 0000H and the RAM address should begin at 4000H. Draw the complete interface diagram.	**07**
	(b)	Describe 8051 architecture with Block diagram.	**07**
		OR	
	(b)	(i) Draw 8085 Bus structure.	**03**
		(ii) Explain in brief how four latches are configured as 4-bit registers.	**04**
Q.3	**(a)**	Describe in detail the various addressing modes and assembler directives supported by 8051 microcontroller with suitable examples.	**07**
	(b)	Write an assembly language program to convert a given binary number into its equivalent BCD code. Eg. $FF_H = 255_d$.	**07**
		OR	
Q.3	**(a)**	8-SPST switches are connected to Port-3 of 8051. Assume that one of the switches is pressed. Write a program to display the no. of switch pressed on seven segment display which is connected to Port 1.	**07**
	(b)	Draw the structure of SCON register and explain the importance of each bit. Write a C-program to transfer letter "M" serially at 4800 baud continuously.	**07**
Q.4	**(a)**	Assuming that XTAL = 22 MHz, write an assembly language program to generate a square wave of frequency 1 KHz on pin P1.3.	**07**
	(b)	Mention the various interrupts available in 8051. Explain in detail the IE(Interrupt Enable) register and IP(Interrupt Priority) Register.	**07**
		OR	
Q.4	**(a)**	Draw and explain 8051 connections with MAX-232 and DB-9 connector.	**07**
	(b)	Describe in brief the different modes in 8255. Assume 8255 is connected with 8051 so that the addresses for Port A, Port B, Port C and Control Word Register are 4000H, 4001H, 4002H and 4003H respectively. Four switches are connected to lower 4-bit lines PB0-PB3. Write a program to transfer the status of these switches to LED's connected to upper 4-bits of Port A.	**07**
Q.5	**(a)**	Interface 16x2 LCD with 8051. Write a C-program to display "WINTER EXAM 2015", continuously.	**07**
	(b)	Explain with a neat sketch how a stepper motor is connected with 8051. Also write a C code to rotate it continuously.	**07**
		OR	

Q.5	**(a)**	Show 8051 connections with 4x4 Matrix Keyboard. Explain with the help of flow chart the logic to identify the key pressed.	**07**
	(b)	Show 8051 connections with DAC – 0808. Write a C-program to generate a sine wave using the same.	**07**

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