Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER 2013

Subject Code: 162002 Date: 29-11-2013

Subject Name: Micro Processors and Micro controllers

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.**

Q.1	**(a)**	Explain how microcontrollers differ from general purpose microprocessors.	**07**
	(b)	State the significance of following pins of the 8085 microprocessor. (i) *ALE* (ii) *READY* (iii) *RESET OUT* (iv) X_1 *and* X_2	**07**
Q.2	**(a)**	Draw and Explain the programming model of the 8085 microprocessor.	**07**
	(b)	Draw and explain the timing diagram of Input/Output Read (I/O Read) machine cycle for the 8085 microprocessor.	**07**
		OR	
	(b)	Classify instruction set of the 8085 microprocessor according to the operation. Give suitable example for each.	**07**
Q.3	**(a)**	Six bytes of data are stored in memory locations starting at 2350h. Write an assembly level program for the 8085 microprocessor to add all the data bytes. Use register B to count any carries generated, while adding the data bytes. Display entire sum at two output ports 80h(LSB) and 81h(MSB), and also store sum at two consecutive memory locations, 2370h(LSB) and 2371h(MSB).	**07**
	(b)	State and explain Non-vectored interrupt process with suitable example.	**07**
		OR	
Q.3	**(a)**	A Binary Coded Decimal (BCD) number is stored in memory location 5260h. Write an assembly level program for the 8085 to convert the BCD number into its equivalent binary number. Store the result in a memory location 5270h.	**07**
	(b)	Write an assembly level delay subroutine for the 8085 microprocessor to generate delay of 200ms. (Assume the crystal frequency = 2MHz)	**07**
Q.4	**(a)**	Draw and explain interfacing of the 8085 with 8Kbytes R/W Memory using 74LS138 decoder with starting address 8000H.	**07**
	(b)	Explain the significance of *EA´* and *PSEN´* pins of the 8051 microcontroller.	**07**
		OR	
Q.4	**(a)**	Explain the following instructions of the 8051 microcontroller with example. (i) *MOVC A,@A+DPTR* (ii) *MOV C,23h* (iii) *MOVX A,@DPTR*	**07**
	(b)	Explain Interrupt Enable (IE) register and Interrupt Priority (IP) register of the 8051 microcontroller with suitable example.	**07**
Q.5	**(a)**	State all the modes of the 8051 timer/counter. Explain working of Mode 1 in detail with suitable example.	**07**

	(b)	Two 24-bit hex numbers, 897F9Ah and 34BC48h, are stored in RAM locations starting from 40h and 50h, respectively. Write an assembly level program for the 8051 microcontroller to add the numbers and store the result in RAM location starting from 60h (MSB First).	**07**

OR

Q.5	**(a)**	Explain the RAM memory space allocation in the 8051 microcontroller.	**07**
	(b)	In a particular semester, a student has taken six courses. The marks of the student (out of 25) are stored in RAM locations 47h onwards. Write an assembly level program for the 8051 microcontroller to find the average marks. Store the quotient part of the average on RAM location 60h and remainder part in RAM location 61h.	**07**

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