Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. - SEMESTER – VI • EXAMINATION – WINTER 2012

Subject code: 160903 **Date: 04/01/2013**

Subject Name: Microcontroller

Time: 02.30 pm - 05.00 pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	Draw and explain the Architectural block diagram of 8051.	**08**
	(b)	Explain various addressing modes of 8051 Instructions with suitable example	**06**
Q.2	**(a)**	Draw and Explain the Memory mapping of 8051 microcontroller in brief with clearly mentioning the all necessary details.	**07**
	(b)	Explain the SFR space in detail. Also mention the addresses which are byte as well as bit addressable in this region. Also explain function of SP, DPTR and PC.	**07**
		OR	
	(b)	List the various general purpose registers available in 8051 microcontroller. Also mention where these register are situated in memory map with their addresses. Give the way of selection for any one register bank out of four register banks	**07**
Q.3	**(a)**	Draw the pin diagram of 8051 microcontroller. Explain the function of RST, EA/Vpp and PSEN pins.	**07**
	(b)	Explain various jump instruction of 8051 microcontroller. Also mention their range.	**07**
		OR	
Q.3	**(a)**	What are bit manipulation instructions? Explain all bit level data transfer instructions in detail.	**07**
	(b)	Explain the Interrupt facility of 8051 microcontroller using IE and IP register. Also mention the internal priority of interrupts and their vector locations.	**07**
Q.4	**(a)**	Explain various data transfer instruction for transferring data (1) from internal memory to registers and vice versa (2)From external memory to 8051 microcontroller and vice versa and (3) from program memory to 8051 microcontroller and vice versa	**07**
	(b)	Write an ALP to count the number of 1's and 0's from the 8 bit data stored in memory location F000h. Store the result in F001h and F002h.	**07**
		OR	
Q.4	**(a)**	What are the assembler directives? Explain any two directives with suitable example, Also mention the Data types in 8051 C programming.	**07**
Q.4	**(b)**	Write an 8051 C program to flash LEDs connected to port- 1, ten times with suitable delay.	**07**
Q.5	**(a)**	Draw and explain the Timer/counter control logic diagram for the selection of any one operation. Also mention the physical availability (situation) of each input signal and its importance.	**07**
	(b)	Draw and explain interfacing circuit of unipolar stepper motor with 8051 microcontroller.	**07**
		OR	
Q.5	**(a)**	Explain the SCON and SBUF registers for serial communication in 8051 microcontroller.	**07**
	(b)	Draw and explain complete scheme to interface in 8 bit ADC to 8051 Microcontroller using port 1 and port 2.	**07**

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