Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – SUMMER • 2014

Subject Code: 160903 Date: 23-05-2014

Subject Name: Microcontroller

Time: 10:30 am - 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.**

Q.1	**(a)**	State the difference between microprocessor and microcontroller	**07**
	(b)	Draw the port structure of P0 and P1. Explain how P0 differs from P1	**07**
Q.2	**(a)**	Give the format of PSW register and explain the function of all flags. Also explain how PSW can be addressed at bit level	**07**
	(b)	Discuss the internal RAM and ROM structure of 8051. What necessary modifications are required to connect external memory to 8051?	**07**
		OR	
	(b)	Explain various addressing modes of 8051 with appropriate illustrations	**07**
Q.3	**(a)**	Write an ALP to make AND operation of two bytes from arrays which start from M.L. 50H to 54H and 60H to 64H without using ANL instruction. Store the result in internal RAM locations 70H to 74H.	**07**
	(b)	Write a program to toggle all bits of port 1. Put a time delay of 50 μS in between each issuing of data to port 1. Use timer 1 in auto reload mode and assume clock frequency to be 11.0592 MHz.	**07**
		OR	
Q.3	**(a)**	Give the format of TCON and TMOD SFR's. Explain how hardware control of timers can be achieved through GATE bit.	**07**
	(b)	Give the format of SCON special function register. Explain how baud rate can be doubled by setting appropriate bit in PCON register.	**07**
Q.4	**(a)**	Write a program using interrupts to simultaneously create 10 kHz and 500 Hz square wave on P1.7 and P1.6 respectively. Use timer 0 in mode 1 for creating 10 kHz wave and timer 1 in mode 2 for generating 500 Hz wave.	**08**
	(b)	Write an 8051 C program to transfer the message "GTU" serially at 9600 baud 8 bit data, 1 stop bit. Do this continuously	**06**
		OR	
Q.4	**(a)**	Assume that PC = 4000H and A = 02H. Explain the reason why the data of 4002H is not loaded in accumulator when the instruction MOVC A, @A+PC is executed.	**03**
	(b)	Give the format of IE and IP SFR's. Also state the priority of interrupts	**08**
	(c)	Explain the following assembler directives (i) ORG (ii) EQU (iii) END	**03**
Q.5	**(a)**	Explain how microcontroller can be interfaced with keyboard. Draw flowchart for reading the code of key that has been pressed	**08**
	(b)	Draw and explain in brief the interfacing circuit of unipolar stepper motor with 8051.	**06**
		OR	
Q.5	**(a)**	With the help of a neat diagram explain the interfacing circuit of LCD with 8051.	**07**
	(b)	Explain simplex, half duplex and full duplex serial transmission. Also discuss the function of (i) CTS, (ii) RTS (iii) DTR (iv) DSR with reference to RS232.	**07**

****