Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – WINTER • 2014

Subject Code: 151001 **Date: 26-11-2014**

Subject Name: Microcontroller and Interfacing

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)**	(1) Give importance of PUSH and POP instruction in RAM content. (2) Make R0 as index register. (3) Explain PSW register of 8051. (4) Briefly discuss EQU and DB directive. (5) Represent -68D in signed number. (6) Find the TH1 value (in both decimal and hex) to set the baud rate 9600 Assume 11.0592 MHz XTAL frequency. (7) How will you alter sequence of interrupt priority.	**07**
	(b)	(1) Explain conditional and unconditional jump instruction	**03**
		(2) List the call instruction and discuss each in brief.	**04**
Q.2	**(a)**	What is addressing mode of microcontroller? Enlist it and explain each with proper example.	**07**
	(b)	Why 8051 called embedded microcontroller? Give logical justification	**07**
		OR	
	(b)	Explain following instruction set by giving suitable example. (1) XOR (2) CJNE (3) ADDC (4) MOVX (5) RETI (6) MOVC A,@A+DPTR (7) DJNE	**07**
Q.3	**(a)**	Discuss the configuration of TMOD and TCON SFR in Timer operation. Prepare ALP (Assembly language program) to generate 250ms delay subroutine using Timer 1 mode 2 with 11.0592 quarts clock.	**07**
	(b)	Draw and describe how 8051 microcontroller communicates serially with Max 232 and DB-9 connector?	**07**
		OR	
Q.3	**(a)**	Design and briefly explain 8031-based microcontroller system to interface 8K bytes Program memory and 8Kbytes Data memory.	**07**
	(b)	Write a C program using interrupts to (1) Generate a 10 KHz frequency on P2.1 using T0 8-bit auto-reload (2) Use timer 1 as an event counter to count up a 1-Hz pulse and display it on P0. Consider 9600 baud rate and 11.0592 MHz clock.	**07**
Q.4	**(a)**	Draw and describe ADC0804 and temperature sensor interfacing circuit with port1 of 8051 Microcontroller.	**07**
	(b)	Write an 8051 C program to send letters ‘M’, ‘D’, and ‘E’ to the LCD using the busy flag method.	**07**
		OR	
Q.4	**(a)**	Describe working of R-2R type digital to analog converter. Write ALP to read first 30 bytes of data stored in external ROM as lookup table starting at 1000H and send it to Port P1.	**07**
	(b)	Prepare ALP and explain necessary configuration to interface 4 digits LED for display 0000 to 1999 digit for 8051 microcontroller.	**07**
Q.5	**(a)**	Prepare ALP and explain necessary configuration to interface SPDT relay with 8051 microcontroller for turning On-Off Red and Green LED	**07**

	(b)	Prepare ALP and explain necessary configuration to run 12V DC motor in both forward and reverse direction.	**07**

OR

Q.5	**(a)**	Prepare ALP and explain necessary configuration to interface 0-5VDC using PWM technique for 8051 microcontroller.	**07**
	(b)	Draw and describe unipolar stepper motor driver circuit using ULN 2003 with 8051 microcontroller.	**07**

****