

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VI • EXAMINATION – WINTER 2013

Subject Code: 160903**Date: 02-12-2013****Subject Name: Microcontroller****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) Draw and explain the block diagram of 8051 Microcontroller **07**
 (b) Explain the working of timer in 8051 using the configuration of TCON and TMOD registers. Explain the difference between timer operation in mode 0 and mode 1. **07**

- Q.2** (a) Explain the advantages of IDE in program development. Explain the steps to create a program in Keil μ Vision3. Why 'C' programming is preferred as compared to assembly programming. **07**
 (b) Draw the configuration of PSW register in 8051. Draw and explain the RAM allocation in the 8051. Explain the switching of register banks using PSW register. **07**

OR

- (b) Ten Hex numbers are stored in RAM locations 50H onwards. Write an assembly language program for 8051 microcontroller to find the biggest number in the set. The biggest number should finally be saved in 60H. **07**
- Q.3** (a) Write an assembly language program for 8051 microcontroller to display a value of "Y at port 0 and "N" at port 2. And also generate a square wave of 10 kHz with Timer 0 in mode 2 at port pin P 1.2. Take Crystal Frequency of 24 MHz. **07**
 (b) Two switches are connected to pins P3.2 (External Interrupt 0) and P3.3 (External Interrupt 1). When a switch is pressed, the corresponding line goes low to give low level-triggered interrupt. Write an assembly language program for 8051 microcontroller to:
 1) light all LEDs connected to port 0, if the first switch is pressed.
 2) light all the LEDs connected to port 2, if the second switch is pressed. **07**

OR

- Q.3** (a) Write an 8051 C program to get a byte of data from P1, wait for $\frac{1}{2}$ second and then send it to P2. Use Crystal frequency of 11.0592 MHz. **07**
 (b) Write an 8051 C program to read the P1.0 and P1.1 bits and issue an ASCII character to P0 according to the following table. **07**

P1.1	P1.0	
0	0	Send '0' to P0
0	1	Send '1' to P0
1	0	Send '2' to P0
1	1	Send '3' to P0

- Q.4** (a) Give the pin description for 14 pin LCD. Draw the interfacing connections between 8051 microcontroller and LCD. **07**

- (b) Write an 8051 C program to send letters 'G', 'T', 'U' to the LCD using delays. **07**
- OR**
- Q.4** (a) A 4 x 4 matrix keyboard is connected to two ports of 8051 microcontroller. Draw the flowchart for determining which key is pressed and obtain scan code from look-up table. **07**
- (b) Draw the hardware interfacing connections between 8051 and ADC0809 for channel 1 input. Write the steps required to get data from this ADC into 8051. **07**
- Q.5** (a) Draw the hardware interfacing connections between 8051 and DAC0808. Write an assembly language program to obtain a five step staircase waveform at analog output of DAC. **07**
- (b) Draw and explain hardware interfacing diagram between 8051 and temperature sensor LM35 through ADC0848. **07**
- OR**
- Q.5** (a) Describe the 8051 connection to the unipolar stepper motor and write an ALP to rotate it continuously. **07**
- (b) Draw and explain the hardware interfacing connections for bidirectional motor control of D. C. motor using L293 chip and optoisolator. **07**
