(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 132602 Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

B.Tech.

(SEM. VI) THEORY EXAMINATION 2013-14

MICROCONTROLLER

Time : 3 Hours   *Total Marks : 100*

Note : (1) Attempt **all** questions. All questions carry equal marks.

(2) Be precise in your answer. No second answer book will be provided.

1. Attempt any **four** parts of the following :   (5×4=20)

(a) How does a microcontroller differ from a microprocessor ? Why are microcontrollers preferred over microprocessors in control applications ?

(b) What is the difference between an embedded and external memory microcontroller ?

(c) Explain the control signals of 8051.

(d) Draw the generalized functional block diagram of a microcontroller specifying each block.

(e) Compare 8051 family of microcontrollers.

(f) Explain different addressing modes supported by 8051 with the example of each.

2. Attempt any **four** parts of the following :   (5×4=20)

(a) With the help of circuit explain port 2 pin configuration.

(b) Give the instructions to copy the byte in TCON to register R2 using at least four different methods.

(c) Find a number that, when XORed to the A register, results in the number 3 Fh in A.

(d) Give the internal RAM organization of 8051. How different register banks are selected ?

(e) A switch is connected to port 0.1. Write a program to check the status of the switch and perform the following : (i) If switch=1, send a high-to-low pulse to activate a siren connected to pin 1.7. (ii) Continue monitoring the pin status.

(f) Explain any five assemblers directives. Why are the ORG and END directives also called pseudocode ?

3. Attempt any **four** parts of the following : **(5×4=20)**

(a) Write a program to count 20,000 events and to generate an interrupt following the 20,000 events and then set bit P1.5. Assuming crystal frequency 11.0592 MHz.

(b) Explain the various SFRs required while programming the serial port.

(c) Find the time a timer in mode 1 takes to overflow if initially set to 03 Aeh with a 12 MHz crystal.

(d) Explain the following SFR's : Interrupt priority (IP) register and Interrupt Enable (IE) register.

(e) Write a program to initialize the serial port of 8051 in model at baud rate 2400.

(f) Write a program to generate a square wave of 50 Hz frequency as output. Assuming crystal frequency 11.0592 MHz.

4. Attempt any **two** parts of the following : (10×2=20)

(a) How is external data memory accessed ? Also show the bus expansion for external memory access.

(b) With a schematic diagram and related program, interface a DC motor to 8051.

(c) With a schematic diagram and related program, interface a Keyboard to 8051.

5. Attempt any **two** parts of the following : (10×2=20)

(a) Describe 8096 microcontroller with the help of block diagram. Why the ALU of the 8096 is called RALU ?

(b) Explain the function of 8255 using block diagram. How 8051 is connected to the 8255.

(c) Compare M68HC11 family of microcontrollers.