

(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.