Printed Pages—3 **EEC014**

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

PAPER ID : 2620 **Roll No.** | | | | | | | | | | |

B.Tech.

(SEM. VI) THEORY EXAMINATION 2011-12

MICROCONTROLLER AND EMBEDDED SYSTEM

Time : 3 Hours *Total Marks : 100*

Note :— (1) Attempt **all** questions.

(2) All questions carry equal marks.

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

(a) What is the difference between a microcontroller and microprocessor ? Why microcontrollers are preferred for controlling operation ?

(b) What is the difference between Harvard architecture and Von-Neuman computer architecture ?

(c) Explain RISC and CISC processor.

(d) Draw and explain the functional block diagram of a microcontroller.

(e) Write an assembly language program to generate a square wave with an ON time of 4 ms and an OFF time of 10 ms on all pins of port 0. Assume an XTAL of 22 MHz.

(f) Explain the addressing modes of 8051 microcontroller with suitable example.

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

(a) (i) Write a program in which 10 bytes of data stored in RAM locations starting from 45 H are transferred serially. At the end of data transfer the value of R0 is displayed on P1.

(ii) Explain data type and directives of 8051 microcontroller.

(b) (i) Describe PSW register and its flag bit.

(ii) Write the instruction for pushing and popping from the stack.

(c) (i) Explain the memory organization of 8051 microcontroller.

(ii) Write a program to convert analog data into digital data with the help of ADC 0804 using conversion and display subroutines.

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

(a) Explain the importance of interrupt in serial communication. Draw the bit format of TCON register. Which bits of SCON register signify the transmission and reception of data ?

(b) Write an assembly language program to send the text string "AMERICA" to serial #1 set the baud rate at 9600. 8 bit and 1 stop bit using timer1.

(c) Write the bit format of TMOD register. With a suitable block diagram explain the all timer mode and discuss the programming of mode 1 timer.

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

(a) Write a program for rotating the stepper motor in anticlockwise direction using half step, 8 step sequences. Draw the connection between 8051 and unipolar stepper motor.

(b) Draw the diagram for interfacing of 8051 controller with 16 K data RAM with the help of latches and gates. Write a program to transfer an array of 10 bytes stored in RAM to another location in same data RAM.

(c) Rewrite the assembly language subroutine for COMMWRT, DATAWRT with all necessary instruction for displaying 'INDIA" on LCD. (Time delay = 0.25 sec.).

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

(a) Draw and explain the architecture of 8096.

(b) Draw the internal functional block diagram 68HC11 with specification.

(c) Using interface of 8255 PPI with MC 8051 :

(i) Write a program to generate a square wave at bit 0 of port C.

(ii) Find the address of ports and control register using the interfacing circuit diagram.