CBCS SCHEME

USN | | | | | | | | | | |

21EC652

Sixth Semester B.E. Degree Examination, June/July 2024
Microcontrollers

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. What is the difference between the microprocessor and microcontroller? **(04 Marks)**

b. With a neat diagram, explain the architectural features of 8051 μc. **(08 Marks)**

c. With a neat pin diagram of 8051 μc and explain. **(08 Marks)**

OR

2 a. Write a note on embedded microcontrollers. **(04 Marks)**

b. With a neat diagram, explain the Internal RAM organization of 8051. **(08 Marks)**

c. Write the interfacing diagram of 4K bytes of RAM and 8K bytes of ROM. **(08 Marks)**

Module-2

3 a. Explain the different addressing modes of 8051 μc. **(10 Marks)**

b. Identify the addressing mode and working of instruction in the following:
(i) MOV A, #25H
(ii) MOV DPTR, #nn
(iii) MOV R3, #1Ch
(iv) MOVC A, @A + DPTR
(v) MOVC A, @A + PC **(10 Marks)**

OR

4 a. Write a program to copy the value of 55H into RAM memory locations 40H to 41H using
(i) direct addressing mode
(ii) register indirect addressing mode without a loop
(iii) with a loop **(10 Marks)**

b. Write a program to store data FFH into RAM memory locations 50H to 58H using direct addressing mode. **(10 Marks)**

Module-3

5 a. Explain the types of CALL instructions. **(06 Marks)**

b. Write a program to compute 1 + 2 + 3 + N (say N = 15) and save the sum at 70H. **(06 Marks)**

c. Write a program to clear 10 RAM locations starting at RAM address 1000H. **(08 Marks)**

OR

6 a. Write a program to toggle all the bits of port 1 by sending to it the values 55h and AAh continuously. Put a time delay in between each issuing of data to port 1. **(10 Marks)**

b. Write a program to toggle the bits of port 1 delay which depends on the value of a number in R0. **(10 Marks)**

Module-4

7 a. Write a note on TMOD and TCON register. **(10 Marks)**

b. Write a program to continuously generate a square wave of 2 kHz frequency on pin P1.5 using timer 1. Assume the crystal oscillator frequency to be 12 MHz. **(10 Marks)**

OR

8 a. Explain the types of serial communication. **(06 Marks)**

b. Explain the serial communication modes. **(06 Marks)**

c. Write a program for the 8051 to transfer letter 'A' serially at 4800 baud rate, 8 bit data, 1 stop bit continuously. **(08 Marks)**

Module-5

9 a. Write a note on IE and IP register. **(10 Marks)**

b. Write a ALP to switch ON a load connected at port Pin 1.3 when timer 0 interrupt occurs. Assume timer 0 operates as timer in mode 1. **(10 Marks)**

OR

10 a. Write an ALP to rotate the stepper motor clockwise/anticlockwise continuously with full step sequence. **(10 Marks)**

b. Explain with a neat diagram of DAC and necessary equation. **(10 Marks)**

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