CBCS SCHEME

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

17EC563

Fifth Semester B.E. Degree Examination, Feb./Mar.2022
8051 Microcontroller

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. List the difference between microprocessor and microcontroller. **(04 Marks)**

b. Sketch and explain internal RAM organization of 8051 microcontroller. **(06 Marks)**

c. With a neat functional block diagram, explain the architecture of 8051-microcontroller. **(10 Marks)**

OR

2 a. Design a 8051 microcontroller system to interface 4 K bytes of ROM and 8 K bytes of RAM. **(10 Marks)**

b. Explain the function of port3 pins of 8051 microcontroller. Write pin diagram of 8051 and indicate function of each pin. **(10 Marks)**

Module-2

3 a. Explain any five addressing modes of 8051 microcontroller. Give an example for each. **(10 Marks)**

b. Mention the function of the following instructions of 8051 microcontroller:
(i) MOVC A, @A+DPTR
(ii) SJMP rel
(iii) MOVX, @DPTR
(iv) SWAP A
(v) DAA **(10 Marks)**

OR

4 a. Show the status of PSW register after executing the following instructions ;
MOV A, #0 BFH
ADD A, # YBH **(04 Marks)**

b. Explain Assembler directives used in 8051 microcontroller. **(06 Marks)**

c. Write an assembly language program to add Five, 8-bit datas by considering the possible carry also. Datas are stored in memory location 8000H location and onwards and store the result in the next successive memory locations. **(10 Marks)**

Module-3

5 a. Write and explain an assembly language program to convert packet BCD to ASCII number and place the result at 40H and 41H memory location. **(06 Marks)**

b. Explain the sequences of events of,
(i) PUSH and POP.
(ii) ACALL and RET instructions are executed. **(08 Marks)**

c. Write an ALP to verify whether the 6 datas present from the location 4000H is odd/even. If odd store AAH from location 50H (Internal memory) store BBH, otherwise. **(06 Marks)**

OR

6 a. Write an ALP to read switch connected to port P1.1. If the switch is closed turn on LED else turn off the LED, connected to P2.1. **(06 Marks)**

b. Write a program to generate a delay of 100 ms. Assume that the oscillator frequency is 12 MHz. **(08 Marks)**

c. For an 8051 microcontroller, find the delay for the following program:

```
Delay : MOV R3, #250
Back : NOP
       NOP
       DJNZ R3, Back
       RET
```

Given frequency of the system is 11.0592 MHz. **(06 Marks)**

Module-4

7 a. Explain various modes of operation of 8051 microcontroller timers. **(06 Marks)**

b. Write an ALP to generate waveform of 10 ms ON and 20 ms OFF on pin P1.1 using timer1 in inrrupt mode with a crystal frequency of 12 MHz. **(08 Marks)**

c. Explain the procedure to follow to transmit and to receive a character serially. **(06 Marks)**

OR

8 a. Write a C program to transfer the message "GO COVID-19" serially at a baud rate of 9600. Assume crystal frequency of 11.0592 MHz. **(06 Marks)**

b. Explain TCON and TMOD registers bits functions. **(08 Marks)**

c. Explain the functions of RS232 pins of DB-9 connector. **(06 Marks)**

Module-5

9 a. Explain various intteruppts available in 8051 microcontroller and also IE register. **(10 Marks)**

b. Write an ALP and C program to rotate a stepper motor 180° clockwise and anticlockwise direction continuously with a step angle of 1.8°. show the interfacing diagram with 8051 microcontroller. **(10 Marks)**

OR

10 a. Bring out the differences between interrupts and polling. **(04 Marks)**

b. Explain interrupt priority register of 8051 microcontroller. **(06 Marks)**

c. Write and explain a C program and assembly to interface an ADC0804 to 8051 microcontroller and display the digital data on P_2. **(10 Marks)**

* * * * *