CBCS SCHEME

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18EE52

Fifth Semester B.E. Degree Examination, June/July 2023
Microcontroller

Time: 3 hrs. Max. Marks: 100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. What is the need of stack memory in microcontroller? How stack is operated in 8051 microcontroller? **(10 Marks)**

b. Explain the different addressing modes of 8051 with an example. **(10 Marks)**

OR

2 a. Describe the bit pattern of Program Status Word (PSW). **(06 Marks)**

b. Explain the memory organization of 8051. **(07 Marks)**

c. Discuss the working of 8051 microcontroller with the help of block diagram. **(07 Marks)**

Module-2

3 a. Explain the unconditional jump instruction with address range. **(08 Marks)**

b. Describe the following instructions with an example for each:
(i) XCHD A, @R_0 (ii) MOVC A, @A + PC (iii) SWAPA
(iv) MOV A, @R_1 (v) DAA (vi) ADDC A, @R_0 **(12 Marks)**

OR

4 a. Write an assembly language program to convert ASCII number to BCD number. **(05 Marks)**

b. Analyze the following instructions and write the comment line for each?

```
MOV  A, #85H
RR A
XCH A, R0
ADD A, R0
SWAP A
```

(05 Marks)

c. Explain PUSH and POP instructions with an example. **(10 Marks)**

Module-3

5 a. Explain the different data types supported by 8051C microcontroller. **(08 Marks)**

b. Describe the significance of TMOD instruction in detail. **(08 Marks)**

c. Write a 8051 ALP program to complement bit $P_{1.5}$ ON and OFF 10000 times. **(04 Marks)**

OR

6 a. Write an ALP to create a square wave of 100 Hz with a duty cycle of 80% on port 1%. Use timer '0', and operate that timer 0 in mode 1. Assume crystal frequency as 12 MHz. **(10 Marks)**

b. A switch is connected to PM $P_{1.2}$. Write on 8051 C program to monitor 'SW' and create the following frequencies on $P_{1.7}$.
SW = 0; 500 Hz
SW = 1; 750 Hz
Use timer 0, mode 1 for both of them. Assume crystal frequency as 11.0592 MHz. **(10 Marks)**

Module-4

7 a. Explain the importance of TI and RI flags. (04 Marks)

b. Describe simplex, half duplex and full duplex serial date transfer. (06 Marks)

c. Write a C program to transfer the message "EXAM" serially at 9600 baud rate, 8 bit data and one stop bit continuously. (10 Marks)

OR

8 a. What is an interrupt? List various interrupts with their corresponding vector address. (06 Marks)

b. Write a program to retrieve the data serially and put them in P_0. Set the baud rate at 4800, 8-bit and one stop bit. (06 Marks)

c. Explain the asynchronous serial communication and data frame format. (08 Marks)

Module-5

9 a. Explain the architecture and working of LCD. Draw its schematic diagram. (10 Marks)

b. Explain the construction and working of stepper motor. Also explain two phase, 4-step stepping sequence, step angle and steps per revolution. (10 Marks)

OR

10 a. Explain the control word format of 8255 IC. Find the control word for following configurations:

(i) All ports of A, B and C are O/P ports (mode '0')

(ii) PA = IN, PB = OUT, PCL = OUT and PCH = OUT (12 Marks)

b. Explain the steps to interface ADC 0808 to the 8051 microcontroller with interfacing diagram. (08 Marks)

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