CBCS SCHEME

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17MT43

Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Microcontroller

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. With the help of neat diagram, explain the architecture of 8051. **(12 Marks)**

b. List out the difference between
i) CISC and RISC
ii) Microprocessor and microcontroller. **(08 Marks)**

OR

2 a. Mention the salient features of microcontroller. **(07 Marks)**

b. With the neat diagram, explain PSW register of 8051 micro-controllers. **(07 Marks)**

c. Explain the following pins of 8051 i) ALE ii) TO iii) PSEN. **(06 Marks)**

Module-2

3 a. Define addressing modes. Explain different addressing modes with suitable example. **(10 Marks)**

b. Explain the operation performed by the following instructions.
i) DA A ii) MUL AB iii) CJNE iv) SETB C **(10 Marks)**

OR

4 a. Assume the P1 is an input port connected to a temperature sensor. Write a program to read the temperature and test it for the value 75. According to the test results place the temperature value into the register indicated by the following : If T = 75, then A = 75 if T < 75 then R1 = T, if T > 75 than R2 = T. **(10 Marks)**

b. Assuming that ROM space starting at 250H contains "India" write a program to transfer the bytes in to RAM locations starting at 40H. **(10 Marks)**

Module-3

5 a. Explain various data types of C with respect to 8051, **(08 Marks)**

b. Write an 8051 C program to toggle the bits of P1 continuously with 250msec delay. **(08 Marks)**

c. Mention the advantages of C code over assembly language. **(04 Marks)**

OR

6 a. Explain the bit configuration of TMOD register. **(06 Marks)**

b. With a frequency of 22MHz, generate a frequency of 100KHz on pin P2.3. Use Timer1 in mode 1. Use assembly code. **(08 Marks)**

c. Write an 8051 C program to create a frequency of 2500Hz an pin P2.7, use Timer 1, in mode 2 to create the delay XTAL = 11.0592MHz. **(06 Marks)**

Module-4

7 a. List and explain the different Land shaking signals of RS232. (06 Marks)

b. Write an assembly program to transfer a letter 'Y', 'E', 'S' serially at 9600 band continuously. (08 Marks)

c. Write a C program for the 8051 to transfer the letter "A" serially at 4800 band rate continuously. Use 8 bit data and 1 stop bit. (06 Marks)

OR

8 a. Explain different interrupts of 8051 with the help of interrupt vector table. (08 Marks)

b. Show instructions to

i) Enable the serial interrupt Timer 0 interrupt and external hardware interrupt

ii) Disable the time 0 interrupt

iii) Show how to disable all the interrupt with a single instruction. (06 Marks)

c. Write 8051 C programs to receive bytes of data serially and put them into P1. Set the band rate at 4800, 8 bit data and 1 stop bit. (06 Marks)

Module-5

9 a. With a flow chart and matrix keyboard connections to port explain different stages involved in keyboard interface with 8051. (10 Marks)

b. Write a 8051 C program to send letters 'H' 'E', 'L', 'L', 'O' to the LCD using delays with circuit. (10 Marks)

OR

10 a. Write a C code to generate a sinewave using DAC. (06 Marks)

b. In DAC interface a switch is connected to P.0.0. Write a program to do the following:

i) When SW = 0, the DAC output given staircase waveform of step 5.

ii) SW = 1, the DAC output gives a triangular waveform. (08 Marks)

c. Write a C code to rotate stepper motor in clockwise direction continuously. (06 Marks)

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