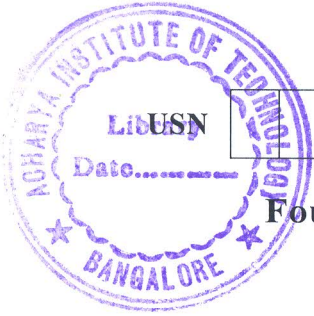


CBCS SCHEME



17MT43

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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 $T > 75$ then $R2 = T$. (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 on pin P2.7, use Timer 1, in mode 2 to create the delay $XTAL = 11.0592\text{MHz}$. (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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