

CBCS SCHEME

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15EC563

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

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain briefly the Harvard and Von-Neumann CPU architecture. (04 Marks)
b. Sketch the internal block schematic of 8051, list the salient features and briefly explain its register set. (12 Marks)

OR

- 2 a. Explain function of following pins of 8051.
i) \overline{EA} ii) \overline{ALE} iii) \overline{PSEN} iv) \overline{RST} (08 Marks)
b. Explain the internal memory organization of 8051. (08 Marks)

Module-2

- 3 a. Define addressing mode. Explain all the addressing modes of 8051 with example. (10 Marks)
b. Explain the operations of the following 8051 instructions.
i) RCL A ii) DA A iii) MUL AB iv) AJMP adder. (06 Marks)

OR

- 4 a. Explain the different types of conditional and unconditional jump instructions of 8051. Specify the different ranges associated with jump instruction. (08 Marks)
b. Add the unsigned numbers found in internal RAM location 25h, 26h and 27h together and put the result in RAM locations 31h (MSB) and 30h (LSB). (08 Marks)

Module-3

- 5 a. Write a delay program to generate a delay of 10Msec. Assume XTAL of 11.0592 MHz without using times. (06 Marks)
b. Explain the usage of the part pins of 8051. (04 Marks)
c. Write an 8051 ALP to convert packed BCD number 48 to ASCII and display the result on port 2 and port 3. (06 Marks)

OR

- 6 a. Write a 8051 ALP to find $\frac{N!}{R!}$ using a subroutine that calculate the factorial of a given number. Assume the values of N and R are stored in location 10H and 11H. Store the value of $\frac{N!}{R!}$ in 12H. Assume $\frac{N!}{R!}$ and N!, R! are all maximum 8 bit value. (10 Marks)
b. WAP to move block of data from one block to another block or memory locations. (06 Marks)

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-4

- 7 a. Mention the difference between counter mode and timer mode or operation with necessary format, explain the various bits of TMOD – SPR. (08 Marks)
- b. Write an 8051 C program to generate square wave of 2KHz using timer 1, mode 2. Show the calculations clearly. Assume a crystal frequency of 11.592 MHz. (08 Marks)

OR

- 8 a. Explain the various mode a serial communication operation. (06 Marks)
- b. Write a program to transmit a message “VTU” serially at a band rate of 9600. Take crystal frequency as 11.0592 MHz. (10 Marks)

Module-5

- 9 a. Explain the interrupt of 8051 clearly mentioning the vector address and permitted. (08 Marks)
- b. Explain about stepper motor interface with diagram and also write a ‘C’ program/assembly program, if another taken 90 steps to make one complete revolution and slow the calculations. (08 Marks)

OR

- 10 a. Explain the features of ADC 0804. Also explain the working or its various pins. (06 Marks)
- b. Interface a LCD display unit to 8051 and write ALP to display the message “DONE”. (10 Marks)
