

CBCS SCHEME

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15EC563

Fifth Semester B.E. Degree Examination, July/August 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. Give comparison between microprocessor and microcontroller. (04 Marks)
b. With neat block diagram, explain the architectural features of 8051. (08 Marks)
c. Write the program status word format of 8051 with individual bit operations. (04 Marks)

OR

- 2 a. Bring out the architectural differences between Von Neumann and Harvard architecture. (04 Marks)
b. With neat diagrams, give details of program memory and data memory of 8051. (08 Marks)
c. Discuss the port 0 configuration of 8051. (04 Marks)

Module-2

- 3 a. Differentiate between the following instructions of 8051 microcontroller:
(i) SWAP and XCHD
(ii) MOVX and MOVC
(iii) Bit level ANL and byte level ANL. (06 Marks)
b. Write an assembly language program to find the square root of a number and store in R₀. (05 Marks)
c. What are the different ranges associated with JUMP instructions of 8051? (05 Marks)

OR

- 4 a. With examples, explain different addressing modes used in 8051. (08 Marks)
b. Write an assembly program to sort an array in ascending order. (04 Marks)
c. Write an ALP to convert a 2-digit Hex number to BCD. (04 Marks)

Module-3

- 5 a. What are the different ways to introduce delay in 8051 C. Give the three factors which affect the accuracy of the delay. (06 Marks)
b. Write an 8051 C program to get an 8 bit number from P1, convert it into ASCII and save the result in memory location 50 H. (10 Marks)

OR

- 6 a. Write an 8051 C program to toggle the bits of P1 continuously with a 250 ms delay. (08 Marks)
b. What is the principle of stack memory? Explain with the help of push and pop instructions. (08 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. How TMOD and TCON registers used to configure timers/counters? (08 Marks)
b. What are the two different ways of transferring a byte of data serially? Write an 8051 C program to send out the value 44 H serially one bit at a time via P1.0. The LSB should go out first. (08 Marks)

OR

- 8 a. Explain serial port in 8051. Explain SCON register in detail. (08 Marks)
b. Assuming XTAL = 11.0592 MHz generate a square wave of 2 kHz on P2.3. (08 Marks)

Module-5

- 9 a. Give different steps followed by 8051 in response to interrupt. How we can enable or disable the interrupts. (06 Marks)
b. Draw the block schematic of stepper motor interfaced to 8051 at port P0 for the rotation of 45 degrees in anticlockwise direction. Write a C program for the same. Assume motor step angle as 1.8 degrees per step. (10 Marks)

OR

- 10 a. Write a program using interrupts to receive data serially and send it to P0. (06 Marks)
b. Interface 2 × 16 line LCD to 8051. Write a C code to display "WELCOME" on LCD. (10 Marks)
