



CBCS SCHEME

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18EE52

Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Microcontroller

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Compare and contrast microprocessor and microcontrollers. (06 Marks)
- b. Explain the various internal blocks of a 8051 CPU with necessary block diagram. (08 Marks)
- c. Discuss the internal memory organization of 8051 microcontroller. (06 Marks)

OR

- 2 a. Explain the bit pattern of program status word. (06 Marks)
- b. Identify the addressing modes of the following instructions:
 - i) `MOVC A, @A + DPTR`
 - ii) `MOV DPTR, #5500H`
 - iii) `MOV A, RO`
 - iv) `MOV 50H, RO`
 - v) `MOV A, @R1`
 - vi) `MOVX A, @DPTR` (06 Marks)
- c. Show how to interface external ROM and RAM to 8051. Explain how 8051 access them. (08 Marks)

Module-2

- 3 a. Write an ALP to find the square root of a given number. (06 Marks)
- b. With a neat diagram, explain the range of JUMP and CALL instructions. (08 Marks)
- c. What are assembler directives? Explain any four of them with an example. (06 Marks)

OR

- 4 a. Write an ALP to complement the content of accumulator 700 times. (06 Marks)
- b. Explain the steps involved to assemble and run an 8051 program. (08 Marks)
- c. Explain the following instructions with an example: i) `DIV AB` ii) `SWAP A` iii) `DA A`. (06 Marks)

Module-3

- 5 a. Explain with an example the different data types supported by 8051 C microcontroller. (08 Marks)
- b. Write an 8051 C program to turn bit P1.5 ON and OFF 5000 times. (04 Marks)
- c. Explain Mode-1 programming of 8051 timer. Describe the different steps to program in Mode-1. (08 Marks)

OR

- 6 a. Write an 8051 C program to convert packed BCD 28H to ASCII and display bytes on P₁ and P₂ port. (06 Marks)
- b. Explain TMOD and TCON register with its bit pattern. (08 Marks)
- c. Generate a square wave of frequency 2kHz using timer in Mode-1 on pin P1.2. Show necessary calculations to find the value of count to be loaded into TH1 and TL1 registers. Assume XTAL frequency = 11.0592MHz. Use assembly program. (06 Marks)

Module-4

- 7 a. Explain interrupt structure of 8051 and facility available for programming of interrupts. (06 Marks)
- b. Write an ALP to transfer the message 'GOOD LUCK' serially at 9600 baud rate, 8-bit data, 1 stop bit. (08 Marks)
- c. Write a C program using interrupts to do the following:
- Generate a 5000Hz frequency on P2.1 using timer 0 with Mode-2 operation.
 - The pulse train is connected to P3.5. Use timer-1 as event counter to count up to a 1Hz pulse and display it on P0. Assume XTAL = 12MHz. (06 Marks)

OR

- 8 a. Describe bit status of SCON register. (06 Marks)
- b. Write 8051ALP in which 8051 reads data from P1 and writes it to P2 continuously while giving a copy of it to serial COM port to be transferred serially. Assume baud rate = 9600. XTAL frequency = 11.0952 MHz. Use timer – 2 in Mode 2. (08 Marks)
- c. Explain bit pattern of IP register. (06 Marks)

Module-5

- 9 a. A switch is connected to pin P2.7. Write a 'C' program to monitor the status of 'SW' and perform the following:
- If SW = 0 : stepper motor moves clockwise
 - If SW = 1 : stepper motor moves anticlockwise. (08 Marks)
- b. Explain the steps to interface ADC 0808 to 8051 microcontroller. (06 Marks)
- c. What is PWM techniques? Explain directional motor control using L293 clip. If SW = 0 the DC motor rotates clockwise and if SW = 1. DC motor rotates counter clockwise. Write the assembly program to do this. (06 Marks)

OR

- 10 a. Explain with a neat diagram the interfacing of DAC0808 to 8051 chip. (06 Marks)
- b. Explain with a neat diagram, the functional block diagram of 8255. (08 Marks)
- c. Write an 8051 C program to send letters 'B', 'Y' and 'E' to LCD using delays. (06 Marks)
