Total No. of printed pages = 5

19/4th Sem/UECE 403

2022

MICROCONTROLLERS

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Show the status of OV flag and contents of A and B after execution of the following instructions. MOV A, #31H MOV B, #03H DIV AB. 2

   (b) If A = D6H and CY = 0, the contents of A after execution of instruction RLC A will be : _____. 2

   (c) Write instructions to subtract 10H from 30H using immediate addressing. 2

   (d) If the contents P0 is 55H, what would be the port contents after execution of instruction : CPL P0 and CPL P0.7 ? 2

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(e) The contents of the accumulator after execution of following instructions will be : MOV A, #55H ORL A, 01H. 2

(f) Give at least two examples of bit level jump instruction. 2

(g) Write the instruction to exchange the contents of the PSW and internal RAM address 50H. 2

(h) MOV SP, #50H PUSH 20H PUSH 30H. Find the current value of the stack pointer after the execution. 2

(i) Mention addressing capacity of Long jump and Absolute jump. 2

(j) Find the content of accumulator after the execution of following instructions MOV A, #0A4H XRL A, #71H. 2

2. (a) Write a program to write the value 55H into RAM locations 40H – 4FH, and add all these contents of RAM locations together, and save the result in RAM locations 60H and 61H. 10

(b) Write an 8051 C program to get a byte of data from P1, wait with finite delay, and then send it to P2. 5

(c) Write instruction for each of the following operation : 5

(i) Clear bits 1,2,3,4 of the A

(ii) Set bits 2,3,4 of the contents of A.

3. (a) Write an 8051 C program to send values of -4 to $+4$ to port P1. 5

(b) (i) Mention the various addressing modes available in Intel 8051 with 2 examples of each. 10

(ii) Write program to add two 16-bit numbers 42E1H and 255CH, save higher byte of result in to R6 and lower byte in R7. 5

4. (a) Write an program to transmit the content of the Accumulator into bit port 1.4 serially with LSB going first. 5

(b) Write an assembly code to send 55H to ports P1 and P2, with finite delay in between the two write operations. 10

(c) Write a program to find the square of a number stored at internal RAM address 50H. Store the result at address 60H (LSByte) and 61H (MSByte). 5

5. (a) An LUT is shown below :

MY_TABLE :

Address	Data
0250H	10H
0251H	20
0252H	35H
0253H	'A'
0254H	'B'

(i) Write an assembly program to send the individual contents of the LUT to the port 1 one after the other. 5

(ii) Write an assembly program to save the contents of the LUT to the RAM starting from address 20H. 10

(b) Write a short note on the indirect addressing mode and explain figuratively with instruction examples. 5

6. (a) Write a program to toggle P1 a total of 200 times. Use RAM location 32H to hold your counter value instead of registers R0 – R7. 5

(b) Explain the Shift register mode of serial communication in 8051. 5

(c) Illustrate the operation of stack to transfer the data bytes from the RAM location 40H, 42H into the stack and back from stack to registers R3, R4. 5

(d) Write a delay loop in Assembly that could run 4000 times. 5