

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

18EC46

Fourth Semester B.E. Degree Examination, July/August 2021 Microcontroller

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. What is the difference between microprocessor and microcontroller? (06 Marks)
 - b. List the SFR's present in 8051 along with its address and also write the importance of reg. A and B. (06 Marks)
 - c. How many pins are present in 8051 microcontroller and explain the function of each pin. (08 Marks)

- 2
 - a. Explain the PSW register and also the find the status of the conditional flags if number AB and FF is added in the accumulator. (06 Marks)
 - b. Write the block diagram of internal RAM of 8051 and explain. (06 Marks)
 - c. Write the interfacing diagram of 4K bytes of RAM and 8K bytes of ROM to 8051 microcontroller and explain. (08 Marks)

- 3
 - a. List the bit level logical instructions present in 8051 and explain its working. (06 Marks)
 - b. Explain the working of following instructions with an example :
 - i) MOVX A, @dptr
 - ii) CJNE @R0, # data, address
 - iii) RETi
 - iv) XRL dataaddress, A
 - v) RL A
 - vi) JZ codeaddress. (06 Marks)
 - c. Write an assembly level program to realize the function $y = A'B + C$ and store the result obtained in carry flag. Assume that bit A is present at 30H, bit B is present at 40H and bit C is present at 50H. (08 Marks)

- 4
 - a. With a neat diagram, explain the range associated with JUMP instruction. (06 Marks)
 - b. Explain the working of MUL and DIV instruction of 8051 with an example. (06 Marks)
 - c. Write an assembly level program to convert the given eight bit binary number into its BCD equivalent and store the result in register DPTR. (08 Marks)

- 5
 - a. What is the use of stack and explain the working of PUSH and POP instruction. (06 Marks)
 - b. Calculate the delay produced by the program given below. Assume that the crystal used is 12MHz.
 MOV R1, #255
 Same : DJNZ R1, same
 Repeat : SJMP repeat
 Also find instead of 255 what value should be stored to get a delay of 200µs. (06 Marks)
 - c. Write an assembly level program to find the number of 1's and 0's present in the external RAM 8000H. (08 Marks)

- 6 a. How many ports are present in 8051? Briefly explain the functions associated with all the ports. (06 Marks)
- b. Write an ALP to find the factorial of given number and store the result in register R3. (06 Marks)
- c. Write a program to check the status of the switch connected to P1.3 of the switch is ON toggle the bits of port P3 else toggle the bit of port 2, to toggle the bits use a subroutine program. (08 Marks)
- 7 a. With a diagram explain the different steps to program timer0 in mode1. (06 Marks)
- b. Write a program for counter1 in mode 2 to count pulse and display the state of TLI count on port 2. Assume that the clock is connected to pin 3.5. (06 Marks)
- c. Write an assembly level program to generate a square wave on P1.3 of frequency 2KHz. Use timer1 in mode1 and show the delay calculation. XTAL used 11.0592MHz. (08 Marks)
- 8 a. Explain the bit pattern of SCON register in 8051 microcontroller. (06 Marks)
- b. Write a 8051 C program to transmit the message ECE using serial communication port of 8051 use baud rate 4800. (06 Marks)
- c. Explain the RS232 DB09 connector signals used for serial communication by connecting it to 8051 microcontroller. (08 Marks)
- 9 a. Write the interrupt vector table of 8051 microcontroller and also explain how the register IE is used for activating the interrupts. (06 Marks)
- b. Write an 8051 C program to generate a square wave of frequency 10KHz on P1.2 using 8bit autoreload timer and also to read the data from P2 and send it through P3 continuously. Use timer interrupt. (06 Marks)
- c. Show how LCD can be interfaced to the microcontroller and using that display the message 'HELLO' on LCD. (08 Marks)
- 10 a. What is the use of IP register in 8051 Microcontroller? If interrupts serial communication, timer1 and timer2, are activated at the same time and if IP contains 10H then how the service will be provided to the interrupts. (06 Marks)
- b. Explain how the external interrupt1 can be used as edge triggered and level triggered interrupt in 8051 with necessary diagram. (06 Marks)
- c. Write a program to rotate a stepper motor in clockwise and anticlockwise direction using the status of the switch connected to the microcontroller. Draw the diagram to show the connection of switch and stepper motor to the 8051 microcontroller. (08 Marks)

* * * * *