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15EC563

Fifth Semester B.E. Degree Examination, July/August 2021 8051 Microcontroller

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1
 - a. Compare between microprocessor and microcontroller. (06 Marks)
 - b. Explain internal block diagram of 8051. (10 Marks)

- 2
 - a. Explain internal RAM organization of 8051. (08 Marks)
 - b. Explain External RAM (8K Bytes) interfacing with block diagram and timing. (08 Marks)

- 3
 - a. Explain any four addressing modes of 8051 with examples. Write a program to copy value of 65H into RAM location 50 to 53H using direct addressing mode without loop. (10 Marks)
 - b. Explain the following instruction with examples: i) XCHD ii) ADDC iii) XRL. (06 Marks)

- 4
 - a. Explain the following instructions with examples: i) CJNE ii) SETB iii) SJMP iv) JC. (08 Marks)
 - b. Write the instructions to do following:
 - i) Setting bit1 of internal RAM location 20H.
 - ii) Reading the content of external RAM location.
 - iii) Moving a data byte into location of 40H.
 - iv) Setting carry flag and clearing parity flag without altering other flags. (04 Marks)
 - c. Analyze the following program and write the result after executing each instruction:


```

                    ORG 00H
                    MOV R0, #21h
                    MOV R7, #78h
                    MOV A, 07h
                    MOV 21H, A
                    SETB 0Ah
                    MOV A, @21h
                    XRL A, R7
                    MOVX @R0, A
                    END
                    
```

(04 Marks)

- 5
 - a. Explain working of PUSH and CALL instructions with examples. (10 Marks)
 - b. Develop an assembly language program to count number of 1's in a given byte which is in internal RAM location 50H. Display the result on port P1. (06 Marks)

- 6
 - a. Develop an assembly language program to find largest in the given N numbers, which are stored in internal RAM location 40H onwards. Store the result in external RAM location 40H, write algorithm. (10 Marks)
 - b. Interface a simple switch and Led to 8051 system and develop the program to read switch status continuously and switch on/off LED accordingly. Draw the block diagram. (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.



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- 7 a. Explain 8051 timer mode-1 programming with steps. (06 Marks)
b. Develop an assembly language program to generate square wave of 2000Hz a P1-1 using timer mode-2. Assume crystal frequency of 11.0592MHz. Show the calculations. (10 Marks)
- 8 a. Briefly explain serial communication basics. (04 Marks)
b. Draw the Bit pattern of SCON register and explain each bit in it. (06 Marks)
c. Develop a program in C/assembly to transmit "VES" serially at 9600 baudrate 1 start and 1 stop bit. Assume crystal frequency of 11.0592MHz. (06 Marks)
- 9 a. Explain 8051 interrupts with their vector address and priority. (08 Marks)
b. Develop a 'C' program to generate a square wave of 1kHz using timer interrupt on P1.2. Assume crystal frequency of 12MHz. (08 Marks)
- 10 a. With a block diagram, explain LCD interfacing to 8051. Develop a program in assembly language to display "MC1" on LCD panel. (10 Marks)
b. Explain stepper motor interfacing to 8051 with a block diagram and explain how to rotate it 180° clockwise. (06 Marks)

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