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## 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.

- 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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