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10ES42

Fourth Semester B.E. Degree Examination, Dec.2015/Jan.2016

Microcontrollers

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. With neat diagram, with the programming model of 8051 with addresses of SFR's and ports. Also give 128 bytes RAM allocation. (12 Marks)
- b. Interface 8051 to 8K external RAM and 32K external ROM and explain how 8051 access them? (08 Marks)
- 2 a. Explain difference addressing modes of 8051. Give an example for each of them and mention limitations of each. (07 Marks)
- b. Explain the following instruction of 8051 with example (values). (09 Marks)
 - i) XCHD A₁ @ Ri
 - ii) MOVC A₁ @ A + PC
 - iii) SWAP A
 - iv) RL A
 - v) MUL AB
 - vi) DA A
- c. Examine the following code and analyse the result with flag register. Content (04 Marks)


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MOV A1 # -30d
MOV R2, # -50d
ADD A, R2
```
- 3 a. Explain the different types of conditional and unconditional jump instruction of and unconditional jump instruction of 8051. Specify the difference range associated with jump instruction. (08 Marks)
- b. Classify the CALL instruction in 8051. Explain each one. (06 Marks)
- c. Write a program to generate and store Fibonacci terms, which are less then FFh. (06 Marks)
- 4 a. What are assembler directives? Explain any four of them. (05 Marks)
- b. Write a program to find LCM (List Common Multiplier) of two number m₁ and m₂. (09 Marks)
- c. Explain C data types for 8051 with their data size in bits and data range. (06 Marks)

PART - B

- 5 a. Explain TMOD and TCON register of 8051 timers. (10 Marks)
- b. For every 50 chocolates, vending machine is getting heated up, it requires minimum of 1sec break after every 50 chocolates. Provide solution for this real time problem. (10 Marks)
- 6 a. What is baud rate? Which timer of the 8051 is used to set the baud rate? (04 Marks)
- b. Explain SCON register with its bit pattern. (08 Marks)
- c. Write a 8051 program to send the data message " MICROCONTROLLERS " of the length 17 character at a baud rate 2400, 8bit data, 1stop bit serially. (08 Marks)
- 7 a. Compare polling and Interrupt. Explain the six interrupt of 8051, with primary and interrupt vector table. (08 Marks)
- b. Write a program to move stepper motor by 20steps is anticlockwise direction interface. (08 Marks)
- c. Explain the advantages of interfacing 8255 with 8051 μc. (04 Marks)
- 8 a. Explain MSP430 architecture with neat block diagram. (08 Marks)
- b. Explain memory address space of MSP430 with neat diagram. (04 Marks)
- c. Write ALP to find larger element in a block of data using MSP430. (08 Marks)

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Important Note : 1. On completing your answers, carefully 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.