



# MASENO UNIVERSITY

## UNIVERSITY EXAMINATIONS 2012/2013

### SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE (MAIN CAMPUS)

#### CCS 210: ASSEMBLY LANGUAGE PROGRAMMING

*Date: 19<sup>th</sup> July, 2013*

*Time: 8.30 – 10.30 a.m.*

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#### INSTRUCTIONS:

- ◆ Attempt Question ONE (COMPULSORY) and any other TWO questions.
- ◆ Diagrams, where required, should be clearly drawn and labeled.
- ◆ MOBILE PHONES are STRICTLY FORBIDDEN in this exam.

QUESTION ONE (COMPULSORY 30MARKS)

- a) Indicate the contents of the 8085 Flags for the following instruction/operation.  
22H + 8EH 5marks
- b) Explain how the 8085 CPU instruction RST  $n$  operates. 3marks
- c) A CPU has 18-address pins. What is the last (highest) address that may be generated (show decimal value)? 2marks
- d) What 8085 instruction moves the LSB of register A into the Carry Flag and the Carry Flag contents to the MSB of register A? 2marks
- e) List any three applications of microprocessor-based system. 3marks
- f) Explain the functions of the two key 16 – bit registers of 8085 microprocessor. 4marks
- g) Differentiate between an Opcode and an Operand 4marks
- h) Explain the difference between a JMP instruction and CALL instruction. 4marks
- i) Write Assembly Language (AL) code to add the following two Hex numbers. Both numbers should be saved for future use and the sum should be saved in the Accumulator. Numbers are: A2H and 18H. 3marks

Question Two (20 Marks)

- a) List out the five categories of the 8085 instructions. Give examples of the instructions for each group. 5Marks

b) Outline the steps involved to fetch a byte in 8085 5Marks

c) Write an assembly language program to subtract a BCD number from another BCD number? 10Marks

**Question Three (20 Marks)**

a) Why the number of out ports in the peripheral-mapped I/O is restricted to 256 ports? 3marks

b) If an input and output port can have the same 8-bit address how does the 8085 differentiate between the ports? 3marks

c) Write an instruction to enable all the interrupts in an 8085 system? 3marks

d) If the 8085 adds 87H and 79H, specify the contents of the accumulator and the status of the S, Z, and CY flag? 6marks

e) What are operations performed on data in 8085 5marks

**Question Four (20 Marks)**

a) List the 8085 interrupts in order of their Priority. 6marks

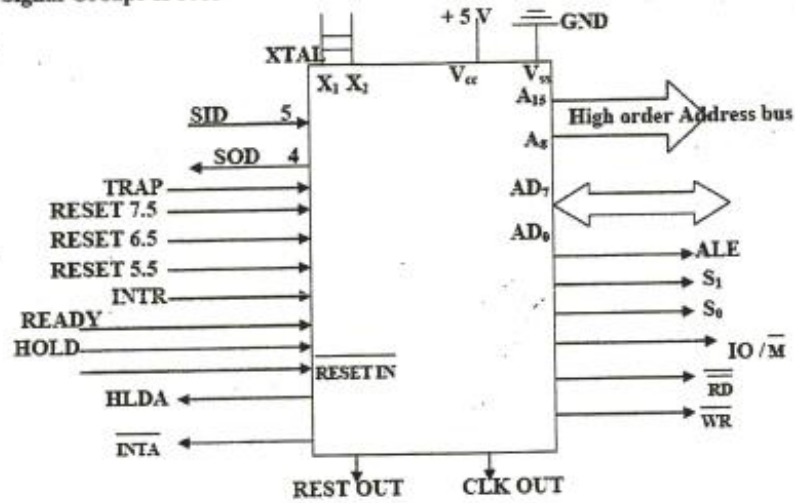
b) Explain the various steps executed by the 8085 CPU microprocessor when an interrupt occurs, until it returns to the next instruction (use any of the hardware interrupts to illustrate your answer.) 8marks

c) Write instructions to load the hexadecimal numbers 65H in register C, and 92h in the accumulator A .Display the number 65H at PORT0 and 92H at PORT1? 6marks

**Question Five (20 marks)**

a) Use the diagram below to give the signal classification of 8085. Briefly explain the function of each class. 12marks

Signal Groups of 8085



j) With reference to the 8085 microprocessor, briefly discuss its addressing modes 5marks

b) Write instructions to 3marks

- i. load 00H to accumulator
- ii. Decrement the accumulator
- iii. Display the answer