KABARAK   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

2008/2009 ACADEMIC YEAR
FOR THE DEGREE OF BACHELOR OF SCIENCE IN
COMPUTER SCIENCE

COURSE CODE: COMP 210

COURSE TITLE: ASSEMBLY LANGUAGE PROGRAMMING

STREAM: **Y2S1**

DAY: **WEDNESDAY**

TIME: **2.00 – 4.00 P.M.**

DATE: **5/08/2009**

INSTRUCTIONS:

1. Answer three questions in all. **Question One is <u>COMPULSORY</u>**.
2. Start each question on a fresh page.
3. Question one carries 30 marks, and the rest carry 20 marks each.

PLEASE TURN OVER

QUESTION ONE (30 MARKS)

a.) What is system software? What are the components of system software? (3mks)

b.) Write a program to add hexadecimal numbers DE with FF (3mks)

c.) Explain any four functions of an operating system. (4mks)

d.) Add $(FFAB)_{16}$ to $(AFCDE)_{16}$. Write a program to implement the above addition with comments. (4mks)

e.) Write a program to subtract decimal number 67 from 78. (5mks)

f.) Explain any four addressing modes used in an 8085 microprocessor with examples (4mks)

g.) i) What is the 2's complement of (10110011)? Write an assembly language program to compute the 2's complement of (i) above with comments. (4mks)

h.) Write a program to exchange numbers in **Memory** locations 8300 and 8306. (3mks

QUESTION TWO (20 MARKS)

a) Draw the block diagram of a typical 8085 microprocessor $(9^{1/2})$

b) Explain the following 8085 microprocessor parts:

i.	Control unit	(2mks)
ii.	Arithmetic and logic unit	(2mks)
iii.	Flag registers	$(2^{1/2})$
iv.	Serial input and serial output	(1mk)
v.	General purpose registers	(3mks)

QUESTION THREE (20 MARKS)

a.) Write a program to arrange numbers in descending order with comments. (8mks)

b.) Explain briefly the memory hierarchy. (5mks)

c.) Differentiate between static RAM and Dynamic RAM (3mks)

d.) Write a program to multiply two numbers in memory (4mks)

QUESTION FOUR (20 MARKS)

a.) What is an interrupt? Explain any two types of interrupts. (5mks)

b.) What is DMA? Differentiate between DMA and interrupt driven Input output (4mks)

c.) Write a program to find the largest of four numbers in memory locations 8000,8001,8002, and 8003 (6mks)

d.) Give the meaning of the following program:

MVI B, 00
LXIH 8000

```
        MOV C, M
LDA 8900
        ORA C
        ADI OF
        JNC  LOOP
        INR B
        MOV A, B
INXH
        STA 8001
LOOP STA 8002
        RST-I
```

What will be the output of the above program if we had FF in 8000?   (5mks)

QUESTION FIVE (20 MARKS)

a.)   Write a program to compute *y=mx+c*. Show comments.   (5mks)
b.)   Convert 111001011 to:

   i)   Hexadecimal
   ii)   Octal
   iii)   Gray code
   iv)   2's complement
                                                                              (5mks)
c.)   What is a utility program? Discuss any four utility programs   (5mks)
d.)   Write a program to divide two numbers in memory   (5mks)