MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

SCHOOL OF SCIENCE AND INFORMATION SCIENCES
BACHELOR OF SCIENCE
(COMPUTER SCIENCE)

COURSE CODE: COM 2107
COURSE TITLE: ASSEMBLY LANGUAGE PROGRAMMING

DATE: DECEMBER 16TH, 2019 **TIME: 8:30 - 1030 A.M**

INSTRUCTIONS

- Answer Question ONE and any other TWO Questions From Section II
- Question 1 is compulsory.
- Time 2HRS.

SECTION 1

Question 1, compulsory (30 marks)

(a) Explain the three execution cycle steps (3 marks)

(b) Suggest three good assembler programs that you would use in machine language programming. (3 marks)?

(c) Explain the following assembly language syntaxes. **(6 marks)**

(i) `section .data`

(ii) section .bss

(iii)
```
section .text
        global main
main:
```

(d) Rewrite the following assembly language statements and, by way of adding comments to each statement,, explain what each code line means. **(12 marks)-**

```
INC COUNT

MOV TOTAL, 48


ADD AH, BH


AND MASK1, 128

ADD MARKS, 10
MOV AL, 10
```

(e) Explain three categories of pointer registers. **(6 marks)**

SECTION II

Question 2, optional (20 marks)

(a) Discuss six advantages of assembly language that makes it worth learning about. **(12 marks)**

b) Given the number 53, convert it into its binary number equivalent. Convert the binary number to its negative and confirm that its equivalent to -53. **(4 marks)**

(c) Subtract 42 from 53. Strictly perform the subtractions in binary number form and confirm that the result is 11. Show all your workings. **(4 marks)**

Question 3, optional (20 marks)

(a) Read the following assembly language program and use it to answer the following questions.

```
        section  .text

                global main
        main:
    1.    Mov edx,len
    2.    Mov ecx,msg
    3.    Mov ebx,1
    4.    Mov eax,4
    5.    Int 0x80
    6.    Mov edx, 9
    7.    Mov ecx,s2
    8.    Mov ebx,1
    9.    Mov eax,4
    10.   Int 0x80
    11.   Mov eax,1
    12.   Int 0x80
section  .data
msg db 'Displaying 10 pluses',0xa
len equ $ - msg
s2 times 10 db '+'
```

(i) Explain the lines 1, 2, 3, 4, 5, 6, 11 **(14 marks)**

(ii) What would be the output of the code when compiled and executed? **(6 marks)**

Question 4, optional (20 marks)

(a) Write a complete assembly language program that multiplies 3by 2 and displays the result put. **(10 marks)**

(b) Write a complete assembly language program that divides 8 by 4 and displays the output/result. **(10 marks)**

//END