THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN BACHELOR OF TECHNOLOGY
IN INFORMATION COMMUNICATION TECHNOLOGY
(BTech. ICT)

EIT 4306: SYSTEMS PROGRAMMING

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: OCTOBER 2012
TIME: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
-   *Answer Booklet*
This paper consist of **FIVE** questions
Answer question **ONE** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

<u>**SECTION A (COMPULSORY)**</u>

Question One (30 marks)

a) Outline the main memory bottlenecks.   **(4 marks)**
b) State the solutions to the Bottlenecks in (a) above.   **(4 marks)**
c) Draw the 8086 Microprocessor Interface block diagram.   **(4 marks)**
d) Write instructions to do the following:
    Load character '?' into register bx
    Load space character in register cx
    Load 26 (decimal) into register cx
    Copy contents of ax to bx and dx   **(4 marks)**
e) State the errors in the following statements.
    Mov   ax   3d

```
Mov      23,    ax
Move     ax,    1h
Inc      ax,    2                                          (4 marks)
```
f) State examples of interrupts.   (3 marks)
g) Illustrate the general flow of an interrupt.   (3 marks)
h) Explain the flags that are affected by the arithmetic instructions.   (4 marks)

SECTION B (Answer Any Two Questions)

Question Two (20 marks)

a) (i) Draw a block diagram of the computer system with DMA.   (4 marks)

    (ii) Outline the process of Data transfer using Direct Memory Access Controller.   (3 marks)

b) Explain with suitable examples the modes of addressing.   (6 marks)

c) With suitable examples, outline the categories of instructions.   (7 marks)

Question Three (20 marks)

a) With suitable diagrams, differentiate between single interrupt system and multiple interrupt system.   (6 marks)

b) Illustrate using flowchart, the basic interrupt mechanism.   (5 marks)

c) Outline the general format of a procedure.   (5 marks)

d) Explain the procedure writing goals.   (4 marks)

Question Four (20 marks)

a) Fill in the table below.   (10 marks)

Mnemonic	Meaning	Format	Operation	Flag Affected
ADC				
SUB				
ICN				
DEC				
DAA				
DAS				

b) What would be the result of executing the following instruction sequence?   (4 marks)

    ADD   AL   BL

    AAA

    Assume that AL contains 32_{16}

    and BL contains 34_{16}

    and AH has been cleared

c) Fill in the table below.   (6 marks)

Task	OP	Operan	Binary	Hex

	Code	d	Code	Code
1. Copy the contents of the Accumulator in the register C				
2. Add the contents of register B to the contents of the Accumulator				
3. Invert (Complement) each bit in the accumulator				

Question Five (20 marks)

a) Write an assembly program to multiply a number by 10   **(5 marks)**
b) Write an assembly program to find greatest between two numbers.   **(6 marks)**
c) Draw the 8086 write by cycle and the read bus cycle, compare the two.   **(9 marks)**