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

Instructions to Candidates:
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

SECTION A (COMPULSORY)

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)**