# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

## *Faculty of Engineering & Technology*

### DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

CERTIFICATE IN COMPUTER MAINTENANCE & ICT – CMNT 2K 11M

### ECT 1108: COMPUTER ORGANIZATION & ARCHITECTURE

END OF SEMESTER EXAMINATIONS

**SERIES:** DECEMBER 2011

**TIME:** 2 HOURS

**Instructions to Candidates:**
You should have the following for this examination
- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A** & **B**
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

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## SECTION A (COMPULSORY)

### Question 1 - 30 Marks

a) Explain the meaning of the term computer architecture.(illustrate using a diagram)    (4 marks)

b) Differentiate between computer architecture and computer organization.

(4 marks)

c) Explain why computers use the binary number system for data representation.

(4 marks)

d) Perform the following conversions:

(6 marks)

    i.    Convert binary $00011011_2$ to decimal
    ii.    Convert decimal $278_{10}$ to binary
    iii.    Convert $19B116_{16}$ to binary

e) Explain the Von Neumann architecture of microprocessors.

(4 marks)

f) Explain the following characteristics of CPUs.

(8 marks)

    i.    Multi-core
    ii.    Multiprocessor
    iii.    Multithreading
    iv.    Over clocking

## SECTION B (ANSWER ANY TWO QUESTIONS)

### Question 2 (20 marks)

a) Explain the Instruction cycle.

(8 marks)

b) State the function of the following components of the control unit.

(8 marks)

    i.    Program counter
    ii.    Instruction register
    iii.    Processor status word
    iv.    Stack pointer

c) List the **four** main components of a microprocessor.

(4 marks)

### Question 3 (20 marks)

a) Explain the meaning of Direct Memory Access.

(2 marks)

b) Describe memory hierarchy in relation to computer data storage.(illustrate using a diagram)

(10 marks)

c) Buses are the collection of wire through which data is transmitted from one part of the computer to another. Outline **4** main buses.    (8 marks)

### Question 4 (20 marks)

a) Explain the meaning of the term volatility in relation to memory.

(2 marks)

**b)** State the **6** main functions performed by I/O interfaces.

(6 marks)

**c)** Explain the **4** main types of ROM.

(8 marks)

**d)** List the **4** main operations performed by a computer.

(4marks)

## Question 5 (20 marks)

**a)** Briefly outline the history of computers, stating the timeline and the major technological inventions of each generation.

(10 marks)

**b)** Explain **3** factors that determine disk access time.

(6 marks)

**c)** Differentiate between random access and sequential access.