THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering & Technology

DEPARTMENT COMPUTER SCIENCE & INFORMATION TECHNOLOGY

CERTIFICATE IN COMPUTER MAINTENANCE AND ICT (CMNT2K11M)

ECT 1108: COMPUTER ORGANIZATION AND ARCHITECTURE

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: FEBRUARY/MARCH 2012
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

SECTION A (COMPULSORY)

Question 1

a) Differentiate between random access and sequential access.
(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) 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)

SECTION B (Answer any Two questions)

Question 2

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

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) Explain the following characteristics of CPUs. (8 marks)

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

Question 4

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

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

(6 marks)

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

(8 marks)

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

(4 marks)

Question 5

a) Briefly outline the history of computers, stating the timeline and the major technological inventions of each generation (10 Marks)

b) Explain **THREE** factors that determine disk access time. (5 marks)

c) Explain the meaning of the term computer architecture.(illustrate using a diagram) (5 marks)