CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE

COSC 0110: COMPUTER ARCHITECTURE

STREAMS: DIP. COMPSCI Y1S1 **TIME: 2 HOURS**

DAY/DATE: MONDAY 4/12/2017 **11.30 A.M – 1.30 P.M**

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- Do not write anything on the question paper
- This is a **closed book exam**, No reference materials are allowed in the examination room
- There will be **NO** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely.
- Marks are awarded for clear and concise answers.

QUESTION ONE (30 Marks)

a. Explain the difference between each of the following: (8 Marks)
   i. Computer Architecture and Computer Organization
   ii. Structure and Function
b. With the aid of a diagram, describe the processor's instruction cycle (6 Marks)
c. List six major advances in the area of computer organization and architecture since the birth of the computer. (6 Marks)
d. With the aid of a well -labelled diagram, describe the structure of the IAS computer designed by John von Neumann (6 Marks)
e. List four main elements of an assembly language program. (4 Marks)

SECTION B (Answer any TWO questions)

QUESTION TWO (20 Marks)

a. Discuss the function of FOUR major components of a processor (8 Marks)
b. State and explain the FOUR main structural components of a computer (8 Marks)

c. State and explain two elements of a machine instruction (4 Marks)

QUESTION THREE (20 Marks)

a. Computer memory can be classified according to its key characteristics. State and briefly explain the classification of memory according to the location and access method. (12 Marks)

b. State and explain two types of parity checking in error detection (4 Marks)

c. With the aid of diagrams, explain the operation of each type in **b)** above (4 Marks)

QUESTION FOUR (20 Marks)

a. Discuss the advantages of assembly language and disadvantage of using an assembly language over Higher Level Languages (10 Marks)

b. State and explain **FIVE** common addressing techniques. (10 Marks)

QUESTION FIVE (20 Marks)

a. Using well -labelled diagrams, explain the function of each of the following sequential circuits. (10 Marks)

   i. Decoder
   ii. Multiplexer

b. Draw a truth table and the logic gate implementation of the Boolean equation below: (10 Marks)

$$F + \overline{A}B\overline{C} + \overline{A}BC + AB\overline{C}$$
