

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATION
RESIT/SPECIAL EXAMINATIONS**

EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE

COSC 0110: COMPUTER ARCHITECTURE

STREAMS: DIP COMP SCI Y1S1

TIME: 2 HOURS

DAY/DATE: MONDAY 01/02/2021

2.30 P.M – 4.30 P.M

INSTRUCTIONS:

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

SECTION A (Answer ALL questions in this section)

QUESTION ONE (30marks)

- a. Define the following terms:
 - i. Register [2Marks]
 - ii. Instruction set architecture. [2Marks]
 - iii. Data Bus. [2Marks]
 - iv. BIOS. [2Marks]
 - v. Pipelining. [2Marks]
- b. List the main components of the CPU. [4Marks]
- c. List TWO purpose of using addressing modes [4Marks]
- d. State FOUR examples of secondary memory devices. [4Marks]
- e. Using 3 inputs, draw a truth table for a XOR gate. [4Marks]
- f. Discuss the functions of Low level I/O [4Marks]

SECTION B (Answer any TWO questions)

QUESTION TWO. (20marks)

- a) Draw a diagram to illustrate the three main components of Von Neumann architecture and explain their functions. [8Marks]
- b) List and explain the three lseek directives. [6Marks]
- c) Give THREE differences between SRAM and DRAM. [6Marks]

QUESTION THREE (20marks)

- a. Using a truth table show by perfect induction that $A+A \cdot B = A + B$ [10Marks]
- b. State and explain THREE types of errors that occurs during data transmission from the transmitter to the receiver. [6Marks]
- c. Explain the concept behind the following terms as used in ISA [4Marks]
 - a. CISC -
 - b. RISC -

QUESTION FOUR (20marks)

- a) Draw the truth table for NAND and OR gates. [4Marks]
- b) By use of Venn Diagrams explain the concept of the Hamming code in error detection and correction.(Hint; use the following data bits;1110) [10Marks]
- c) Discuss the differences between ASCII and UNICODE. [6Marks]

QUESTION FIVE (20marks)

- a. Using low level I/O, write a simple C program to create a file called test.txt in the read/write mode and write "hello world!" [6Marks]
- b. Error detection is the process of detecting the errors that are present in the data transmitted from transmitter to receiver, in a communication system. State and explain FOUR types of error detection. [8Marks]
- c. Discuss any THREE addressing modes [6Marks]