

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DIPLOMA IN
COMPUTER SCIENCE

COSC 0110: COMPUTER ARCHITECTURE

STREAMS: DIPLOMA COMP SCI. (Y1S1)

TIME: 2 HOURS

DAY/DATE: MONDAY 14/12/2020

8.30 AM – 10.30AM

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. List three types of input devices. (3Marks)
- b. List and explain the main components of the CPU. [8 Marks]
- c. Draw the symbols for the following logic gates: (4Marks)
 - i. AND
 - ii. XOR
- d. Using a truth table show the 3-inputs for AND gate. (3Marks)
- e. Define the following terms. (4 Marks)
 - i. Instruction sets.
 - ii. Address modes.
 - iii. Volatile Memory.

- iv. Computer Architecture.
- f. Write the meaning of the following assembly mnemonics (4marks)
 - i. JMP
 - ii. JSR
 - iii. BRA
 - iv. BEQ
- g. Explain the concept behind the following terms as used in ISA. (4marks)
 - i. CISC
 - ii. RISC

SECTION B (Answer any TWO questions)

QUESTION TWO. (20marks)

- a) By use of Venn Diagrams explain the concept of the Hamming code in error detection and correction. (Hint; use the following data bits;1110) (10 marks)
- b) List four types of error detection techniques. (4marks)
- c) Draw a diagram to illustrate the three main components of Von Neumann architecture and explain their functions. [6Marks]

QUESTION THREE. (20marks)

- a) Explain steps of instruction execution in the CPU. (6 marks)
- b) Give THREE differences between SRAM and DRAM. [6Marks]
- c) 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]

QUESTION FOUR. (20marks)

- a. State FOUR examples of secondary memory devices. (4 marks)
- b. Show by perfect induction that $A + \bar{A} \cdot B = A + B$. (10marks)
- c. Discuss the differences between ASCII and UNICODE. [6Marks]

QUESTION FIVE. (20marks)

- a. Describe the following file access modes: (4 marks)
 - i) a
 - ii) r⁺
 - b. State and explain THREE types of errors that occurs during data transmission from the transmitter to the receiver. [6Marks]
 - c. List and explain the three lseek directives. [6Marks]
 - d. State and explain TWO types of pipeline hazards. (4 Marks)
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