CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE

COSC 0110: COMPUTER ARCHITECTURE

STREAMS: DIP. COMP SCI. Y1S1 **TIME: 2 HOURS**

DAY/DATE: TUESDAY 21/09/2021 **11.30 A.M. – 1.30 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) What characteristic of RAM memory makes it not suitable for permanent storage? (2 marks)
b) Explain the following terms:
   i. Response time. (2 marks)
   ii. Throughput. (2 marks)
   iii. Pipelining. (2 marks)
   iv. Instruction Set Architecture. (2 marks)
   v. Page fault. (2 marks)
c) Giving examples, differentiate between interrupts and exceptions. (4 marks)
d) Differentiate physical address from logical address. (4 marks)
e) List and explain the three lseek directives. (6 marks)

f) Draw the truth table for NAND and OR gates. (4Marks)

SECTION B (Answer any TWO questions)

QUESTION TWO. (20 marks)

a) What is virtual memory? Explain the steps involved in virtual memory address translation. (7 marks)

a) Explain about multicore processers. (4 marks)

a) Explain three different types of addressing modes with a suitable example. (9 marks)

QUESTION THREE (20marks)

a) Explain steps of instruction execution in the CPU. (6 marks)

b) Differentiate between SRAM from DRAM which are the two types of Random Access Memory. (6 marks)

c) Explain the stored program concept. (4 marks)

d) Draw symbols for AND and NOR gates. (4 marks)

QUESTION FOUR (20marks)

a) State and provide a short description for the 3 pipelining hazards. (6 marks)

b) Consider the logic function with three inputs: A, B, and C.
Output D is true if at least one input is true
Output E is true if exactly two inputs are true
Output F is true only if all three inputs are true

i. Show the truth table for these three functions. (2 marks)

ii. Show the Boolean equations for these three functions. (3 marks)

iii. Show an implementation consisting of gates (invertors, AND, OR, NOR, etc). Connect your circuit to the provided feeds (input and output). (5 marks)

c) Explain what is meant by address mapping? (4 marks)

QUESTION FIVE (20 marks)

a) Using a truth table show by perfect induction that A+A• B =A +B (10 Marks)

b) State and explain THREE types of errors that occurs during data transmission from the transmitter to the receiver. (6 Marks)

c) Explain the concept behind the following terms as used in ISA (4 Marks)

i. CISC -

ii. RISC –

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