



MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY

(MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR SEMESTER 11

FOR THE DIPLOMA

IN

INFORMATION TECHNOLOGY

COURSE CODE: DIT 075

COURSE TITLE: COMPUTER ORGANIZATION AND ARCHITECTURE

DATE: 28/04/2022

TIME: 8:00 – 9:30AM

INSTRUCTIONS TO CANDIDATES

Answer Questions **ONE** and **ANY OTHER TWO** IN SECTION B.

TIME: 1 HOUR 30 MINUTES

MMUST observes **ZERO** tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over. ▲

Question One (24 Marks)

- a) Define the following terms as used in Computer Organization and architecture (3 marks)
 - i. Virtual memory
 - ii. Interrupts
 - iii. Clock rate
- b) Differentiate between computer organization and computer architecture. (2 marks)
- c) Identify any **FIVE (5)** registers in the CPU and describe their functions. (5 marks)
- d) State and explain the **FOUR (4)** main structural components of a computer. (4 marks)
- e) Draw the Von-Neumann architecture. (4 marks)
- f) Distinguish between volatile and nonvolatile memory. (3 marks)
- g) Discuss **THREE (3)** parameters one should consider when choosing a computer memory. (3 marks)

Question Two (18 Marks)

- a) Describe the **FOUR (4)** structural components of the computer that form the basis of computer organization and architecture. (8 marks)
- b) Identify any five registers in the CPU and describe their functions. (5 marks)
- c) Explain the following as applied by cache memory: (2 marks)
 - i. Cache hit
 - ii. Cache miss
- d) Highlight **THREE (3)** types of cache memory (3 marks)

Question Three (20 Marks)

- a) What is cache memory? (2 marks)
- b) List **TWO (2)** types of cache memories. (2 marks)
- c) How is cache memory different from primary memory? Give **FOUR (4)** differences. (8 marks)
- d) Present an overview of associative mapped cache, direct-mapped cache and set-associative mapped cache. (6 marks)

Question Four (20 Marks)

- a) What does parallel processing mean in computer organization and architecture? (2 marks)
- b) State **THREE (3)** advantages of parallel processing. (3 marks)
- c) Give a brief discussion of the various ways in which parallel processing can be achieved. (7 marks)
- d) Differentiate between paging and segmentation as methods of virtual memory configuration. (2 marks)
- e) Explain serial data transfer and parallel data transfer with an example. (4 marks)

Question Five (20 Marks)

- a) Discuss about the following modes of I/O transfers (9 marks)
- i. Programmed I/O
 - ii. Interrupt driven I/O
 - iii. DMA

b) What is pipelining? (2 marks)

c) Explain the hazards associated with pipelining (4 marks)

d) State **THREE (3)** advantages of pipelining (3 marks)

e) The cache memory is the fastest type of memory among the three basic types of computer memories. The secondary storage, though has a highest storage capacity than both primary and cache memories, it is slow hence cannot be used directly with the CPU. Explain why manufacturing a single computer memory with a large storage capacity as the secondary storage and as fast as the cache memory is not feasible. (2 marks)