



**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY**

**(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2021/2022 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER EXAMINATIONS**

**FOR THE DIPLOMA**

**IN**

**INFORMATION TECHNOLOGY**

**COURSE CODE: DIT 095**

**COURSE TITLE: PLATFORM TECHNOLOGY**

**DATE: 25/04/2022**

**TIME: 3:00 -4:30PM**

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**INSTRUCTIONS TO CANDIDATES**

Answer Question **ONE (1)** and any other **TWO**

**TIME: 1 Hour 30 Mins**

MMUST observes **ZERO** tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.

### QUESTION ONE (24 MARKS)

- a. Define the term computing platform as used in platform technology (2 marks)
- b. Explain the following types of platforms (5 marks)
  - i. Hardware architecture
  - ii. An operating system (OS)
  - iii. Runtime libraries.
- c. Explain the most remarkable development of the English mathematician Charles Babbage (Father of Computer) in 1822 (3 marks)
- d. Use radix representation to convert the binary number (101.01) into decimal. (4 marks)
- e. Differentiate between systolic architecture and RISC architecture as used in computer organization and architecture (4 marks)
- f. Differentiate between arithmetic pipeline and instruction pipeline (4 marks)
- g. Differentiate between direct and indirect addressing as used in addressing modes (2 marks)

### QUESTION TWO (18 MARKS)

- a. Pipelining has been applied effectively in computer processors.
  - I. Define the term pipelining (2 marks)
  - II. State its importance in computing (2 marks)
  - III. Differentiate between linear and synchronous pipelining (4 marks)
- b. State the problems associated with pipelining (3 marks)
- c. A task has four subtasks with time  $t_1=60$ ,  $t_2=50$ ,  $t_3=90$  and  $t_4=80$  seconds. Calculate:
  - I. Latch delay (1 mark)
  - II. Pipeline cycle time (1 mark)
  - III. Execution time for non-piped task (1 mark)
  - IV. Speed (1 mark)
  - V. Pipeline time for 1000 tasks (1 mark)
  - VI. Sequential time for 1000 tasks (1 mark)
  - VII. Throughput for 1000 tasks (1 mark)

### QUESTION THREE (18 MARKS)

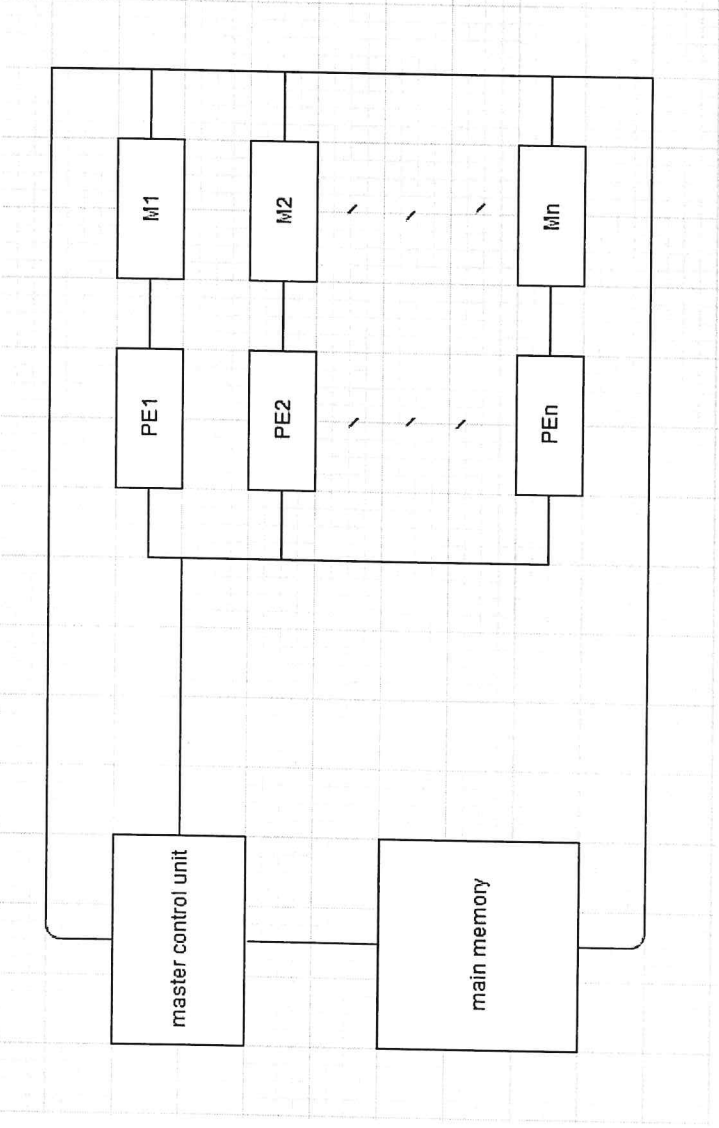
- a. Given the following arithmetic to be performed by floating point Adder pipeline, describe how addition is of A and B is done
$$X = A * 2^a$$
$$Y = B * 2^b$$
(4 marks)
- b. Differentiate between Windows and Unix-like operating systems (4 marks)

- c. Describe what each line of the above program does **(5 marks)**
- d. List any three examples of gadgets where the above description language is applied **(3 marks)**

#### **QUESTION FIVE (18 MARKS)**

- a. Memory management is one of the functions of the operating system. Briefly explain five memory management requirements **(5 marks)**
- b. Briefly explain the difference in segmentation and paging as a type of memory partitioning **(4 marks)**
- c. Briefly explain any five addressing modes as applied in operating systems. **(5 marks)**
- d. By use of a diagram explain the various stages of process states as invoked by the OS **(4 marks)**

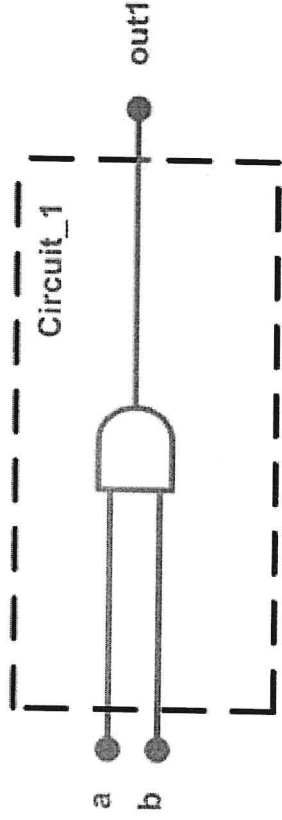
- c. Explain the meaning of the following terms as used in platform technology
- i. RISC
  - ii. CISC (4 marks)
- d. Explain the four main features of CISC (4 marks)
- e. You have been given a computer with the following type of Vector (array) processor. By stating which type of array processor it is, explain how it improves the performance of this type of computer (6 marks)



#### QUESTION FOUR (18 MARKS)

VHDL is one of the commonly used Hardware Description Languages (HDL) in digital circuit design.

- a. Draw a general structure of a simple digital circuit of VHDL (4 Marks)



- b. Write a simple program to show the input and output ports of the circuit above (6 marks)