MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER

SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES

DEGREE OF BACHELOR OF SCIENCE (COMPUTER SCIENCE AND EDUCATION)

COURSE CODE: COM 1205-1

COURSE TITLE: COMPUTER ORGANISATION AND ARCHITECTURE

DATE: 17/5/2024   TIME: 1430-1630 HRS

INSTRUCTIONS TO CANDIDATES

- **Question ONE in Section "A " is Compulsory**
- **Answer any Two (2) Questions from Section "B"**

Illustrate your answers where necessary

QUESTION ONE – COMPULSORY (30 Marks)

a) Explain the following terms as used in computing.
   i. POST. (1 Mark)
   ii. BIOS. (1 Mark)

b) Explain what registers are and their importance in CPU operations. (4 Marks)

c) State **TWO** user interfaces in a computer system. (2 Marks)

d) State **TWO** advantages and **TWO** disadvantages of machine language. (4 Marks)

e) Convert the following numbers into decimal numbers (3 Marks)
   a) 110110_2
   b) $2A3B_{16}$
   c) 2573_8

f) Local Area Networks may be grouped into Server-based or Peer-to-Peer categories based on their communication.

   i. With the aid of a diagram and detailed explanation, differentiate between Peer-to-peer networks and Server-based networks. (2 Marks)

   ii. Discuss **THREE** network communication devices used in a Server-based network. (3 Marks)

g) Name 3 parts of a computer system that are capable of being upgraded and briefly explain the steps of upgrading them. (3 Marks)

h) Draw the symbols for the following logic gates: AND, OR, NOT, NAND, NOR, XOR, and XNOR. (7 Marks)

QUESTION TWO (15 MARKS)

a) Explain **TWO** benefits associated with internet use. (2 Marks)

b) Name **THREE** parts of a computer system that are capable of being upgraded and briefly explain the steps of upgrading them. (6 Marks)

c) Discuss the differences between sequential and parallel processing, including examples and advantages of each approach. (4 Marks)

d) Pauline a computer administrator chose a Command line interface tools for her work, state **THREE** reasons for her choice. (3 Marks)

e) explain the types of busses that exist. (2 Marks)

f) explain the following terms (3 Marks)
   i. Clock Speed
   ii. Register
   iii. Clock Synchronization

QUESTION THREE (20 MARKS)

a) Citing examples, explain **TWO** printing devices that gives carbon copies.

(4 Marks)

b) State **THREE** uses of ICT specific to students. (3 Marks)

c) Ken a new student at MAASAI MARA University wanted to learn how to take care of a magnetic storage device, he approached his lecturer. State and explain two precautions he learnt. (4 Marks)

d) Explain **TWO** methods of data representation in a computer system (4 Marks)

e) Explain the concept of arithmetic logic unit (ALU) and its role in performing arithmetic and logic operations in a computer system. (2 Marks)

f) Discuss the difference between the Von Neumann architecture and the Harvard architecture. (3 Marks)

QUESTION FOUR (20 MARKS)

a) Explain **THREE** problems associated with computer viruses. (3 Marks)

b) Explain the term "network protocol" and discuss its role in enabling communication between devices on a network. (3 Marks)

c) Discuss the difference between RISC and CISC architectures. Compare their advantages and disadvantages. (5 Marks)

d) Describe the function of an I/O controller in managing input and output devices. (2 Marks)

e) Amos a student at MAASAI MARA University experienced the following problems on his computers, highlight **ONE** likely problem associated with the following symptoms in his computers.

   i. Computer does not start but beeps continuously. (1 Mark)

   ii. Monitor does not display anything. (1 Mark)

   iii. UPS keeps beeping (1 Mark)

f) Citing examples, explain the following scanning devices.

   i. OCR. (2 Marks)

   ii. MICR (2 Marks)

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