MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

FIRST YEAR **FIRST** SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN BIT, BBIT, BMCS, BCT

SIT 101 – COMPUTER SYSTEMS AND ORGANIZATION

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer Question **ONE** and Any other **TWO** questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

QUESTION ONE (30 MARKS)

a) What are two benefits of using a semiconductor transistor logic in digital computer compared to using vacuum tubes or mechanical switches. (4 marks)

b) Compute the following value to its respective base. (3 marks)
Octal Hexadecimal Decimal Binary 36

c) Identify the key functions of an ALU. (4 marks)

d) List two differences between ROM and RAM. (4 marks)

e) List two advantages of sequential storage devices such as disk drivers. (4 marks)

f) Identify with an example the unit of measure of
   i. CPU processing speed (2 marks)
   ii. Persistent file storage (2 marks)
   iii. RAM memory access speed (2 marks)
   iv. Network VO speed (2 marks)

g) A CPU provides OS support, differentiate between kernel and user modes. (2 marks)

QUESTION TWO (20 MARKS)

a) List two key differences between CIS and RISC instruction set (4 marks)

b) Describe the basic stages involved in instruction pipeline, indicating the primary task performed in each stage. (8 marks)

c) Describe eight components of an ATX computer mother board. (8 marks)

QUESTION THREE (20 MARKS)

a) Write the letters 'Hello' in ASCII binary form. (5 marks)

b) List five components of Pale bus. (5 marks)

c) Using an illustration, describe the structure of a computer hard disc. (10 marks)

QUESTION FOUR (20 MARKS)

a) Perform the following binary operations
   i. $01100001_{10} + 00010101_{10}$ (2 marks)
   ii. $01110001_{10} + 01010101_{10}$ (2 marks)

b) A processor implements its operations using logic gates. Name the three basic logic gates, draw their symbols and respective truth table. (9 marks)

c) Discuss how CPU hardware multithreading is implemented. (7 marks)