(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS
END OF SEMESTER EXAMINATIONS

2021/2022 ACADEMIC YEAR
SECOND YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DIPLOMA IN
(INFORMATION TECHNOLOGY)

COURSE CODE: DIT 075

COURSE TITLE: COMPUTER ORGANIZATION AND ARCHITECTURE

DATE: 30/08/2022 **TIME:** 09.00 A.M. – 11.00 A.M.

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

Paper consists of 2 printed pages

QUESTION ONE (COMPULSARY) [24 MARKS]

a) Differentiate between Computer Organization and Computer Architecture. **[4 Marks]**
b) Name three main components of every computer giving the functions for each. **[3 Marks]**
c) Name the characteristics present in a von Neumann architecture. **[3 Marks]**
d) Explain the difference between RAM and ROM. **[4 Marks]**
e) Explain the term input/ output, giving examples **[6 Marks]**
f) Convert 104_{10} to base 3 using subtraction. **[4 Marks]**

QUESTION TWO [18 MARKS]

a) Create truth tables for the Boolean operators OR, AND, and NOT. **[9 Marks]**
b) Generate truth table for F(X, Y, Z) = X Y + Y Z **[4 Marks]**
c) Explain what the CPU should do when an interrupt occurs. Include in your answer the method the CPU uses to detect an interrupt, how it is handled and what happens when the interrupt has been serviced. **[5 Marks]**

QUESTION THREE [18 MARKS]

a) Explain the following terms as used in data representation in computer systems. **[4 Marks]**

i. Bit
ii. Byte
iii. Word
iv. Nibbles

b) Define system software giving examples that you know. **[4 Marks]**
c) Explain five functions of an operating system **[10 Marks]**

QUESTION FOUR [18 MARKS]

a) Add 010011112 to 011000112 using signed-magnitude arithmetic. **[6 Marks]**
b) Perform the following conversions: **[12 Marks]**

i. Convert 110010011101_2 to octal and hexadecimal
ii. Convert 31214 to base 3.
iii. Convert 0.430410 to base 5

QUESTION FIVE [18 MARKS]

a) Briefly discuss the following terms as used in computing. **[8 Marks]**

i. PROM
ii. EPROM
iii. Cache Memory
iv. Virtual memory

b) Explain the functions of SEVEN registers of MARIE **[7 Marks]**
c) Discuss the THREE basic forms of locality **[3 Marks]**