



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
ICT**

2nd YEAR, 1st SEMESTER 2021/2022 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: ICB 1104

COURSE TITLE: COMPUTER SYSTEM ARCHITECTURE

EXAM VENUE:

STREAM:

DATE: APRIL 2021

EXAM SESSION:

TIME: 2.00 HOURS

INSTRUCTIONS:

- 1. Answer Question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION 1 [30 MARKS]

- a) The CPU is comprised of three main parts. Identify them. **(3 marks)**
- b) What is a computer system? Illustrate. **(3 marks)**
- c) Modern computers are electronic and digital. List down the hardware components that are required for use in a general-purpose computer. **(5 marks)**
- d) Identify five functions of a computer. **(5 marks)**
- e) List down the two types of primary memory. **(2 marks)**
- f) Software is a generic term for organized collections of computer data and instructions. With examples, list down the two major categories of software used by organizations. **(4 marks)**

- g) Differentiate the following types of computers.
 - i. Supercomputer and Mainframe computer.
 - ii. Minicomputer and a Personal computer.
 - iii. Special-purpose (dedicated) computers and General-purpose computers. **(6 marks)**
- h) Which type of system puts the user into direct conversation with the computer through a keyboard? **(2 marks)**

Question Two (20 Marks)

- a) Examine the differences between RAM as a main memory and HDD as a Secondary Memory. **(10 marks)**
- b) In the second half of the 20th Century, many countries moved into the Information Age. What changes to a society indicate that it is moving into the information age? **(3 marks)**
- c) The central processing unit is the computer's main processing device. Name the CPU's three different components and describe what they do. **(7 marks)**

Question Three (20 Marks)

- a) Today's computers use secondary storage systems to store data that is not currently being processed. Name and describe three different types of storage systems that use disks. **(6 marks)**

b) Data loss occurs when data is accidentally deleted or something causes data to become corrupted. Examine the various ways in which digital data can be lost.

(10 marks)

c) RAID is an acronym for Redundant Array of Independent/Inexpensive Disks. The simplest way to think about RAID is that it allows multiple hard drives to be coupled together as a single larger storage capacity drive. Examine the key differences between RAID 0 and RAID 1.

(4 marks)

Question Four (20 marks)

a) Bits and Bytes both measure amounts of data. However, they are typically used in two different contexts. Explain.

(4 marks)

b) Showing detailed steps, convert the following binary numbers to decimal numbers

i. 101001_2

ii. 10111_2

iii. 11010011_2

(6 marks)

c) Show the hexadecimal equivalent of the bit pattern $00\ 1110\ 0010_2$.

(3 marks)

d) Show the octal equivalent of the bit pattern $101\ 110\ 010_2$.

(3 marks)

e) Convert the following decimal numbers to their binary equivalents

i. 128

ii. 256

(4 marks)

Question Five

a) A process is a program in execution. It is a unit of work within the system. Program is a passive entity, process is an active entity. Examine the activities that the operating system is responsible for in process management.

(6 marks)

b) System programs provide a convenient environment for program development and execution. They can be divided into seven categories. Discuss.

(14 marks)