



KISII UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF BACHELOR OF SCIENCE IN APPLIED COMPUTER SCIENCE

SECOND SEMESTER 2023/2024

[JAN – APRIL, 2024]

ACMP 102: COMPUTER SYSTEMS

STREAM: Y1 S2

TIME: 2 HOURS

DAY: THURSDAY, 12:00 - 2:00 P.M.

DATE: 04/04/2024

INSTRUCTIONS

- 1. Do not write anything on this question paper.***
- 2. Answer question ONE (Compulsory) and any other TWO questions.***

QUESTION ONE [30 Marks]

- a). Explain the importance of the system clock [3 Marks]
- b). Explain any FOUR types of memory and their relevance to the computer [4 Marks]
- c). Define the term register in the context of CPU and explain any THREE registers within the CPU. [5 Marks]
- d). Describe the following character representation [8 Marks]
(i) ASCII
(ii) ANSI
(iii) EBCDIC
(iv) Unicode
- e). A computer system is made up of various components. Identify and describe FOUR components of a computer system. [5 Marks]
- f). Explain TWO indicators of a Faulty computer. [2 Marks]
- g). Outline FOUR main elements of an assembly language program [3 Marks]

QUESTION TWO [20 Marks]

- a). Explain the THREE main categories of computer architecture [6 Marks]
- b). Describe the role of data bus and address bus and state the benefit of increasing the width of the bus. [8 Marks]
- c). Give the standard logic symbols and truth tables of the operation of each of the following gates. [6 Marks]
- i). XNOR gate
 - ii). XOR gate
 - iii). OR gate

QUESTION THREE [20 Marks]

- a). When data is being sent to a printer an interrupt may occur. State TWO reasons why an interrupt may occur in this case. [4 Marks]
- b). State the TWO major components of the Central Processing Unit citing what each does. [4 Marks]
- c). Design a logic circuit of a 3 input NAND gate and then prepare its truth table [12 Marks]

QUESTION FOUR [20 Marks]

- a). Registers are useful during the execution of instructions. Discuss FOUR registers found in a computer processor. [4 Marks]
- b). Draw the logic circuit for each of the Boolean expressions given below
- (i) $Q = A \cdot B + C$ [4 Marks]
 - (ii) $Q = AB + BC(B + C)$ [4 Marks]
- c). Convert the decimal numbers 4297 to its BCD equivalence [8 Marks]

QUESTION FIVE [20 Marks]

- a). Explain THREE features of Von Neumann architecture. [6 Marks]
- b). Perform conversion of the following number systems; show all the working.
- i) From octal to binary [4 Marks]
 65_8
 147_8
 - ii) From hexadecimal to binary then to decimal [4 Marks]
 $BE7_{16}$
- c). Distinguish between combinational circuits and sequential circuits [6 Marks]