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**451/1**

**COMPUTER STUDIES**

**PAPER 1**

**THEORY**

**TIME 2 ½ HOURS**

**FORM 4 LANJET EXAMINATIONS**

**JULY/AUGUST 2023**

**Kenya Certificate of Secondary Education (KCSE)**

COMPUTER STUDIES

PAPER 1

THEORY

**INSTRUCTION TO CANDIDATES**

* Write your name and Admission number in the spaces provided above
* *This paper consists of* ***two*** *sections A and B.*
* *Answer* ***ALL*** *questions in section A.*
* *.Answer question* ***11*** *and any other* ***THREE*** *questions from section B.*
* *All answers should be written in the spaces provided on the question paper.*

**For Examiners Use Only**

|  |  |  |
| --- | --- | --- |
| Section | Questions | Candidates Score |
| A | 1-15 |  |
| B | 16 |  |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 |  |
| TOTAL SCORE | |  |

This paper consists of **11** printed pages. Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

***SECTION A***

***Answer All questions in this section***

1. Suggest **two** disadvantages of a notebook computer when compared with a desktop

Computer. (2 marks)

* Notebooks generally have limited upgrade options compared to desktops

1. (a)What is a software suite? (1 mark)

* a collection of software applications that are bundled together to provide a comprehensive solution for a specific purpose.
* A software suite is a collection of computer programs and applications that are bundled together and designed to work together seamlessly to perform a range of related tasks or functions

(b)Suggest **two** advantages of using a software suite. (2 marks)

* Users can obtain multiple programs in a single package, often at a discounted price compared to buying each program separately.
* They share common features, user interfaces, and file formats to facilitate integration and interoperability.

1. (a) Explain the two major types of software. (2 marks)

* System software
* Application software

(b) Give an example of each of the above (2 Marks)

Examples of system software

* Operating system
* Utility software
* Networking software
* Firmware

Examples of application software

* Word processors
* Database management systems
* Desktop publishing software
* Spreadsheets
* Presentation software

1. (a) Explain the term Process Control. (1 Mark)

* Refers to the mechanisms and techniques used to ensure that a manufacturing or industrial process operates efficiently, effectively, and consistently within desired parameters. It involves monitoring and adjusting various aspects of the process to maintain desired conditions, such as temperature, pressure, flow rate, and chemical composition.

(b) State two areas where process control is used in industry (2 Marks)

* **Chemical Processing**
* **Automotive Manufacturing**

1. (a) Give **one** advantage of serial connection over parallel connection. (1 mark)

* better suited for long-distance communication compared to parallel connections
* less cabling hence low cost
* Are more flexible and scalable than parallel connections.
* Serial connections can offer better noise immunity compared to parallel connections, especially in environments with high electromagnetic interference (EMI) or radio frequency interference (RFI

(b) Give **one** advantage of parallel connection over serial connection. (1 mark)

**Higher data transfer rates**

* multiple bits of data are transmitted simultaneously over separate channels or wires, allowing for faster transmission speeds
* used in computer buses, memory interfaces, and high-performance computing systems

1. (a) Explain the term pipelining as used in CPU (1 mark)

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(b) Explain How parallel processing work (1 mark)

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1. Give **two** advantages and **two** disadvantages of display devices (e.g., monitors).

(4 marks)

*Advantages:*

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*Disadvantages:*

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1. (a)Explain briefly why increasing the main memory may improve the performance (e.g.,

speed) of a computer system. (1 mark)

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(b) Explain the term memory address as used in primary memory (1 mark)

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1. Explain the following as used in word processing (3 Marks)
   * 1. Spell-check

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* + 1. Thesaurus

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* + 1. Macros:

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1. Explain the following spreadsheet concepts:
   * 1. Automatic Recalculation. (1 mark)

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* + 1. What if analysis (1 mark)

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1. Suggest **two** advantages of using presentation graphics software over the traditional

chalk-and-talk approach in a school environment (2 marks)

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1. (a) Explain the term workstation as used in a networked environment (1 mark)

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(b)What is a server? (1 mark)

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1. (a)Explain briefly **identification** and **authentication** in computer access control. (2 marks)

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(b)What is a personal identification number (PIN)? (1 mark)

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1. (a)Explain the term ergonomics. (1 mark)

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(b)Suggest **two** possible causes of eyestrain when using computers. (2 marks)

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1. State **Three** benefits of telecommuting. (3 marks)

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**SECTION B**

***Answer question 16 (compulsory) and any other three questions from this section***

1. (a)(i) State and describe three types of error can occur in programming: (3 Marks)

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(ii) When is a programming language considered structured? (2 marks)

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(b)(i) The Global Science Museum is not large and can become over-crowded when more than 300 people are in the building. They would like a program that will stop visitors from entering when more than 300 visitors are in the building.

Design a Pseodocode segment for this problem using a REPEAT loop. You do not have to worry about visitors who leave the building, just those who have entered. (3 Marks)

(ii) Identify **Three** aspects of a good HCI? (3 Marks)

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(c)(i) Give **one** advantage of compliers over interpreters (1 mark)

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(ii)Give **one** advantage of interpreters over compliers (1 mark)

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(iii) Explain briefly why the source codes must be translated again if the programmer wants

to use the program on a computer with a different platform. (1 mark)

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(iv). Explain why a programmer may prefer to write code for device drivers using low level languages.

(1 Mark)

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1. (a) (i) With the aid of examples, explain number complements in the Binary number systems

(2 marks)

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(ii) Outline the benefits of using binary number complementation in computers. (2 marks)

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(b) (i) Why is binary number system best suited for use in computers? (2 marks)

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(ii) Convert the following base two number into base ten. (2 marks)

 11.01

(iii)Convert the following base sixteen number into base two. (2 marks)

DEF=

**(c)** Carry out the following binary arithmetic:

(i) 11 + 10 (1 mark)

 (ii) 1010.0112 – 11.01112 (2 mark)

 (iv) 101 – 11 (1 mark)

1. Describe briefly the three data processing modes (3 marks)
   * 1. Batching Processing Mode

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* + 1. *Real-time Processing Mode*

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* + 1. *Interactive Processing Mode*

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(b)(i) Suggest **two** possible reasons for data preparation errors. (2 marks)

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(ii) Suggest **two** possible reasons for data input errors. (2 marks)

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(c) (i)Distinguish between **data validation** and **data verification**. (1 mark)

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(ii)Give **two** examples of data verification techniques. (2 marks)

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(d) Describe briefly the following data validation techniques

1. Presence Check (1 mark)

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1. Type Check (1 mark)

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1. Range Check (1 mark)

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1. Control Total Check (1 mark)

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1. Parity Checks (1 mark)

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1. (a) (i) Explain the term search engine (1 mark)

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(ii) Peter and Mary use the same keyword to search for information. Suggest **two** reasons

why their search results may vary. (2 marks)

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(iii)State **one** disadvantage of using an e-mail account provided by the Internet service

provider (ISP). (1 mark)

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(b) (i) Explain the term URL (1 mark)

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(ii) For the URL **http://www.csklsc.net/pe/calendar.htm**,

***http*** stands for (1 mark)

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The domain name is (1 mark)

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The top-level domain (TLD) is (1 mark)

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***pe*** stands for (1 mark)

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(c) (i) Explain the term communication protocol (1 mark)

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(ii)Explain the following types of communication protocol

**Ethernet** (1 mark)

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**Token Ring** (1 mark)

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**TCP/IP** (1 mark)

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(iii)Give **Two** examples of wireless-based communications channels. (2 marks)

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1. (a). Describe the role of the systems analyst. (2 Marks)

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(b). Describe Two techniques used by the systems analyst in requirements elicitation. (2 Marks)

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(c)What is a requirements specification and what does it contain? (5 Marks)

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(d) Software development is often said to be an *iterative process*.

Describe Two events that might spark an iterative process in software development. (2 Marks)

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(e) (i) Describe briefly the **three** basic e-commerce models. (3 Marks)

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(ii) Apart from parental control, state **one** other ways of Internet censorship. (1 mark)

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