

**451/1 – COMPUTER PAPER 1
FORM 4 - 2019**

**END OF TERM II EXAMINATION
MARKING SCHEME PAPER**

1. Micro Computers

- Are smaller in size thus portable.
- Are for personal use.
- Operates on the principle of a microprocessor.
- Are generally easy to operate.

2. (a) CTRL + ESC – Activates the Start Menu.
(b) ALT + F4 – Closes currently running program / application.
(c) CTRL + DEL – Restarts the computer.

3. Data loss prevention:

- Shutting down computer procedurally.
- Avoiding banging of disk.
- Scanning disk often to clean viruses.
- Performing disk scan to test and fix bad sectors.

4. Portability with regard to hardware means the ability of hardware to be carried from one place to the other WHILE with regard to software it means the ability of software to be copied and used in more than one computer.

5. (a) Formatting Features

- (i) Drop cap is a feature used to make the first character in sentence to be large and occupy two or more lines.
- (ii) Subscript is a feature used to make a character appear below other Characters for example O₂: 2 is a subscript.

(b) - Text alignment

- Indentation
- Drop cap

6. - Data Terminal Equipment e.g. Computer Modem.

- Telecommunication facility.
- Internet Service Provider.

7. (a) - Installation of most updated Anti-virus software and running it frequently to detect and clean known viruses.

- (b) - Enforce data / information access control policies.
- Encrypting data.

- Keeping room under lock and key / use burglar proofing and employing guards.
- Enforce Network security.

8. (a) Use place value method to convert 25_{10} into Binary.

Place value	$2^5 = 32$	$2^4 = 16$	$2^3 = 8$	$2^2 = 4$	$2^1 = 1$	$2^0 = 1$
Diff	$25 - 32$	$25 - 16$	$9 - 8$	$1 - 4$	$1 - 2$	$1 - 1$
Binary Digit	0	1	1	0	0	1

(b) 8 – bits

$$9_{10} = 1001_2 = 00001001_2 \dots\dots\dots \text{eq.1}$$

$$|-11_{10}| = 1011_2 = 00001011_2 \text{ Bitwise NOT } (00001011_2) = 11110100_2$$

$$\text{Two's comple} = 11110100_2$$

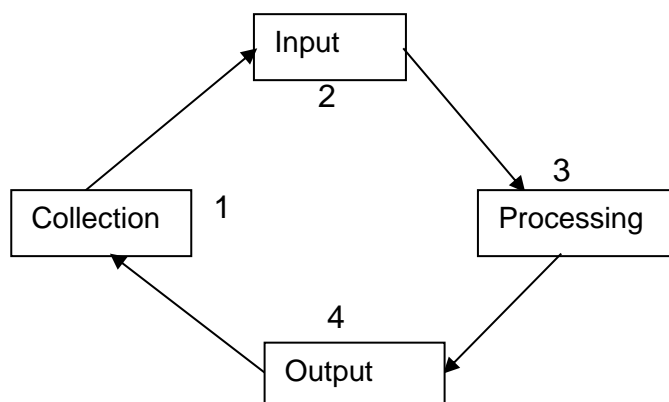
$$\begin{array}{r} + \\ \underline{1} \\ = 11110101 \dots\dots\dots \text{eq.2} \end{array}$$

Add eq. 1 + eq. 2 then ignore the overflow bit.

$$\begin{array}{r} 00001001_2 \\ + 11110101_2 \\ \hline 11111110_2 \end{array}$$

Therefore $9_{10} - 11_{10} = 11111110_2$

9. Data process cycle refers to input-processing – output stages that data goes through to be transformed into information as shown below.



10.(a) Source of Code – is a program in its original form before being converted into executable form through translation.

(b) Translator is a program that converts a source code into object code.

11.(a) - Resources sharing

- Remote communication
- Cost Effectiveness
- Distributed Processing facilities.

(b) - High initial cost

- Moral and cultural effects.
- Security issues.
- Spread of terrorism and drug trafficking.

12.- Computer Technician

- Computer Programmer
- Software Engineer
- Computer Engineer
- Database Administrator
- Information Systems Manager

13.- Crime detection through biometric analysis.

- Store records of offenders.
- Communication between officials.

14.- Job creation.

- Growth of automated production.
- Job displacement.

15.

- Cache – High speed memories used to speed up processing power of computer.
- Buffers – are special memories that provide temporary data holding location for data to-from the processor.
- Registers – are memories that hold one place of data entry at a time.

SECTION B (60 MARKS)

(i) Selection control structure

(ii) The printed values are

P=8, Q=14, x=8 and y=14

(b) Looping executes the same block of code (module) again and again until a certain condition is fulfilled, while selection execution of a statement(s) depends on a condition that returns true or false (yes / No) **(Well explained 2mks)**

(c) (i) Documentation

(ii) Testing and Debugging

(iii) Program Design

(1 for each correct answer

given)

The flowchart

17. (a) Describe **three** standard coding scheme used in computing and electronic systems.

(3mks)

- Binary Coded Decimal (BCD)
- Extended Binary Coded Decimal Interchange Code (EBCDIC)
- American Standard Code for Information interchange (ASCII).

(b) Convert the decimal number 0.5625_{10} into its binary equivalent.

(3mks)

Solution

Fractional part

$$0.5625 \times 2 = 1.125$$

$$0.125 \times 2 = 0.250$$

$$0.250 \times 2 = 0.500$$

$$0.500 \times 1 = 1.000$$

$$= 0.1001_2$$

(c) Convert the binary number 110.101 to its Decimal equivalent.

(3mks)

You assign place values.

$$(1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) + (1 \times 2^{-1}) + (0 \times 2^{-2}) + (1 \times 2^{-3})$$

$$4 + 2 + 0 + 0.5 + 0.125$$

$$= 6.625_{10}$$

(d) Using **twos** Complement, perform the following binary arithmetic leaving the answer in binary notation.

$$100101_2 - 1101_2$$

$$= 11000_2$$

(e) Other than the ring topology, name other three types of topologies.

(3mks)

- (i) Bus topology
- (ii) Star topology
- (iii) Mesh topology
- (iv) Tree / Hierarchal topology

18. (a) One of the functions of an operating system is Job scheduling. Explain what is meant by Job Scheduling.

(2mks)

- The scheduler decides which of the jobs is to be allocated to the CPU for processing.
- Allocating CPU time to jobs.
- Sequencing of jobs in a queue.

(b) Recently on 4th March 2013 Kenya went on election in which the results were to be transmitted

electronically using mobile phones from all polling stations to the main server. But the system (Server) failed to work.

(i) Two security threats that the system was prone to:

(2mks)

- Tapping
- Hacking
- Sabotage
- Alteration of data
- Damage of software.
- Fire and natural disaster.

- (ii) Control measures that the IEBC should take in future to ensure secure and safe tallying of votes. (2mks)
- Careful recruitment of staff.
 - Set up a clear and firm management policy on crimes and frauds.
 - Restrict access to computer room or terminal,
 - Monitor and investigate error logs and reports on regular basis.
 - Use transaction and fill logs to monitor access to sensitive areas of the system.
 - Use of back-ups.
- (d) The principal of Chebloch Primary School wants to acquire a new operating system for his computer. Advise him stating the advantages of graphical user interface over Command line interface. (2mks)
- Its user friendly.
 - Faster to work with as it works relies on the user clicking icons by the use of pointing devices.
 - Easy to use by even those who are not skilled.
- (e) (i) **Truncated** – It results from having real number that have a long fractional part being cut e.g. 73.73487 can be 73.734.
- (ii) **Transposition** – it results from incorrect reading of source document e.g. 69371 can be 69731.
- (iii) **Transcription** – occurs during data entry e.g. misreading and transposition.
- (e) Explain why the processor of a microcomputer is referred to as a microprocessor.
- It is small / tiny chip put into a silicon chip.
19. (a) List and explain the functions of computer buses. (2mks)
- **Data bus** – carries data to and from the CPU i.e. pathway where the actual data transfer takes place.
 - **Address bus** – used to locate the storage position in memory where the next instruction or data to be processed is held.
 - **Control bus** – it is the pathway for all timing and controlling functions sent by the control unit to other parts of the system.
- (b) The formula = \$B2 + C\$4 is entered in cell C5 and then copied to D10. Write down the formula as it appears in the destination cell.
= \$B7 + D\$4
- (c) Two reasons why smaller computers like Laptops tend to be more expensive than Desktop computers.
- The technology of producing smaller devices is expensive.
 - They are convenient because they are portable.
 - They have advanced power management capabilities (they consume less power a laptop can operate on rechargeable batteries).
- (d) Three categories of post-secondary institutions where one can advance computer skills after sitting for KCSE.
- **Universities** – Kenyatta, Nairobi, JKUAT, Egerton.
 - **Polytechnics** – Kenya, Mombasa, Eldoret, Kisumu.
 - **Colleges** – Institutes e.g. Public and Private.
- (e) Four examples of:-
- (i) Third Generation Languages (2mks)
- Pascal
 - FORTRAN
 - BASIC
 - COBOL

(ii) Object Oriented Languages:-

(2mks)

- Simula
- Small Talk

- Java
- C++

(f) Define the term Ergonomics

- It is a science that determines the best working conditions for humans who work with machines.

20. (a) (i) User interface – Displays screen that enables the user interact with the system.

(ii) Knowledge base - This is the expert systems database of knowledge about a particular subject/ it contains relevant facts, beliefs, assumptions and procedures for solving a particular problem.

(iii) Inference Engine – Is software that applies the rules from a knowledge base in the data provided by the user to draw conclusion. (Is a computer program that tries to derive answers from a knowledge base). (Award 2mks for each of the three correct options).

- (b)
- Swift Kenya
 - Africa Online
 - Today's Online
 - Wananchi Online
 - Interconnect

(Award 1mk each for three correct options)

(c) -E-mail (Electronic Mail). Exchange of electronic letters, data and graphics on the internet.

- E-learning (Electronic Learning) learning through interaction with special programs on the computer.

- E-Commerce (Electronic Commerce). Trading activities over the network environment.

- World Wide Web (www) – Internet server that allows connection of a network to the internet. (Award 1mk for each of the 4 correct answers)

d) Give one example of Internet search engine. (1mk)

- yahoo.com
- google.com
- alta vista
- excite