

**LAINAKU PREMOCK 2015
COMPUTER STUDIES PAPER 1
MARKING SCHEME**

1. Computers can be classified according to size, functionality and purpose.
 - (a) Outline two examples of smaller microcomputers also known mobile devices (1 mark)
 - Laptops and notebook computers – Portable and all in one case.
 - Tablet computer – Like laptops, but with a touch-screen, entirely replacing the physical keyboard.
 - Smart phones, smartbooks, PDAs and palmtop computers – Small handheld computers with limited hardware.
 - Programmable calculator– Like small handhelds, but specialized on mathematical work.
 - Handheld game consoles – The same as game consoles, but small and portable.
 - (b) What is the function of the following computers?
 - i) Workstations (1 mark)

Workstations are computers that are intended to serve one user and may contain special hardware enhancements not found on a personal computer.
 - ii) Embedded computers (1 mark)

Embedded computers are computers that are a part of a machine or device. Embedded computers generally execute a program that is stored in non-volatile memory and is only intended to operate a specific machine or device. Embedded computers are very common. Embedded computers are typically required to operate continuously without being reset or rebooted, and once employed in their task the software usually cannot be modified. An automobile may contain a number of embedded computers; however, a washing machine and a DVD player would contain only one
 - iii) Servers (1 mark)

Server usually refers to a computer that is dedicated to provide a service. For example, a computer dedicated to a database may be called a "database server". "File server" manages a large collection of computer files.
2. Why is it necessary to have a UPS in a computer laboratory? (2 marks)
 - To regulate amount a voltage entering computer equipment
 - To supply equipment with power temporarily while normal power is not available
3. a) What do you understand by the term ‘computer crime’ (1 mk)
 - This is the use of computer hardware or software for illegal activities, for example stealing, forgery defrauding, etc.
 - Committing illegal acts using a computer or against a computer system.
 - Theft or deliberate destruction of computerized data

b) Explain the difference between the following terms in reference to computer crime (3 mks)

 - i) Cracking – use of guesswork over and over again trying to look for weak access points in software in order to get access to data & information
 - ii) Tapping - Listening to a transmission line to gain a copy of the message being transmitted.
 - iii) Hacking – Breaking of security codes and passwords to gain unauthorized access to a computer system.
4. Data security is very important in any institution. Describe any two ways in which data can be lost and mention ways on how each can be prevented (2 mks)

- Attack by malicious programs e.g viruses, worms and Trojan horse

Prevention- Install Antivirus software

- Piracy- illegal copying of copyright protected data and information

Prevention- Enforcing data and information access policies

- Sabotage- Altering or deleting data and information deliberately

Prevention – Reinforce computer room security

5. Explain the following sensible safety precautions to take when building your own PC so as to avoid harming your health or computer component. How can one avoid:

- (a) Electric Shock (1 mark)

When working on your PC or any mains-powered equipment, always disconnect it completely from the mains wall socket.

- (b) Sharp Edges (1 mark)

Beware of sharp edges inside PC Cases and the small solder pins on boards. A harmless-looking case edge can be as sharp as a razor, and remove large chunks of flesh if accidentally nudged with a slipping hand.

- (c) Static charges (1 mark)

Discharge your self using Wrist member. The static charges can destroy components on the motherboard when bare figure comes into contact with them such as RAM

Before you take the plunge and begin to build your new PC, be sure to take note of the following precautions and advice we offer (often as a product of a painful and/or expensive experience!)

6. a) What is a web search engine? (1mk)

- A web search engine is a software system that is designed to search for information on the World Wide Web.

b) Below is an email address of LainVas company, identify the parts labeled i - iv (2mks)

lainvas @gmail . co.ke
↑ ↑ ↑ ↑
i ii iii iv

i - Name of the individual or organization

ii- Name of the host computer in the network on which the e-mail account is hosted

iii- Identifies the type of the organization or institution offering a particular service, i.e. commercial organization

iv- Name of the country where the site is located, i.e. Kenya.

7. a) Explain the function of the following devices in networking: (3 mks)

- | | | |
|-----|----------|---|
| i) | Bridge | This is a network device that selectively determines the appropriate network segment for which a message is meant to be delivered. |
| ii) | Gateway | Gateways provide access to the Wide area networks & the Internet. |
| iv) | Repeater | A repeater receives a weak signal on the network, cleans and amplifies it for transmission over the next portion of the network. Signals become weak due to attenuation |

b)(i) What is the meaning of protocol in networking? (1 mk)
- set of rules and procedures that govern the communication between two different devices or people

(ii) Give two examples of protocols (2 mks)
- Transmission Control Protocol (TCP)
- Sequential Packet Exchange (SPX)
- BetBEUI
- Apple Transmission Protocol(ATP)

8. Explain how each of the following would affect the suitability of a room for use as a computer lab.

(a) Burglar proofed door (1 mark)
- enhances the security system as it prevents unauthorized users from entering

(b) Availability of taps and sinks in the room (1 mark)
- Could be detrimental since water can cause damage to computer equipment

9. Differentiate between single-user and multi-user operating systems giving an example of each. (2 marks)

Single user O/s – allows one user to operate one program at a time in an interactive conversational mode e.g. MS-DOS

Multi-user O/S – Computer system can be accessed by several users or Applications simultaneously. Windows 2000

10. a) State two data representation codes used in computers (1 marks)

ASCII- American Standard Coded for information interchange

BCD – Binary coded Decimal

EBCDIC – Extended Binary Coded Decimal interchange Code

b) Arrange the following data units in ascending order of size (1 mks)

BYTE, FILE, BIT, NIBBLE

BIT, NIBBLE, BYTE, FILE

11. a) List two methods of gathering data during system developments process. (2 marks)

- Observations - Interviews
- Automatic data capture - Studying reports

b) State and explain two types of documentation in program development and give the purpose of each (2mark)

User Oriented – Includes format of input required e.g. Source documents, how to produce outputs, how to run the program etc

Operator oriented – Description of main action of the programs file specifications, restrictions, limitations, text references.

Program Oriented - Program design using structure charts/ flow charts testing procedures (including test data and expected output)

Identification- Includes of program, short statement of its functions, author, date written language used and version and hardware requirements.

12 (a) Explain the term nibbles as used in data representation in computers (½ mark)

- A nibble refers to a half a byte or 4 bits (A byte is equivalent to 8 bits)

b) Define the term structured programming (½ mark)

A program is broken down into smaller sections called modules. The modules are linked together.

13. a) Define local area network. (1 mark)

A local-area network (LAN) is a computer network that spans a relatively small area. Most LANs are confined to a single building or group of buildings; however, one LAN can be connected to other LANs over any distance via telephone lines and radio waves

b) State any four components of a local area network (2 marks)

- file server
- Printer server
- communication controller (software)
- workstation or terminals
- Network interface cards (NIC)
- Network cables
- networking accessories e.g. accessories e.g. ports

14 . As regards to communication within a computer network, what do you understand by the following terms:

i) Ethernet topology (1 mark)

- all computer listen to the network media and can only send data when none of the others is sending

ii) Token ring topology (1 mark)

- a special data package (token ring) goes around the network and only the computer whose addressing on the data held in the token will take up the token to read the data then release the token to be used by other computers

15. Briefly explain two reasons why organizations need to network their computers. (2 marks)

Sharing of information and other resources like printers, internet

Fault tolerance. It is safer to have several copies/services of work spread in a network

Economy of scale. Cheaper to have a network than a centralized system

Communication e.g. email, chatting etc.

Scalability, it is cheaper to add computers on a network than to do an upgraded

SECTION B [60 MARKS]

Answer questions number 16 and any other three from this section. Each question carries 15 marks

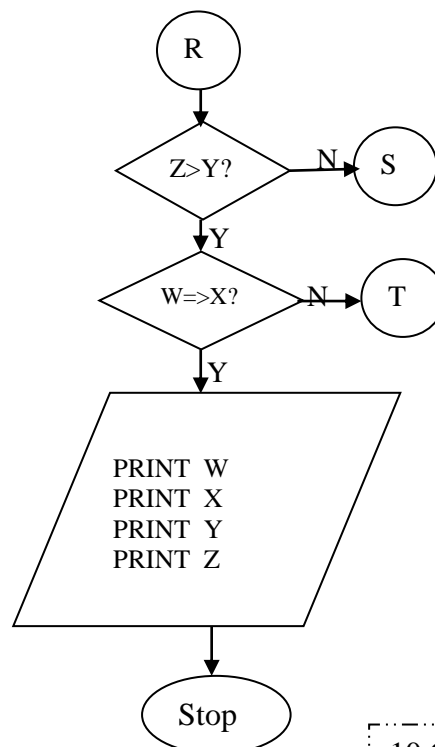
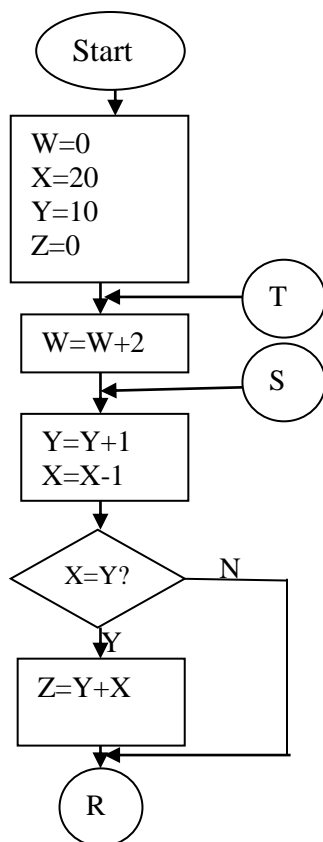
16. (a) Study the following pseudo code then answer the questions that follow.

```

START
  W= 0
  X=20
  Y=10
  Z=0
  WHILE W<X
    W=W+2
    REPEAT
      X=X-1
      Y=Y+1
      IF X=Y
        Z=Y+X
      END IF
    UNTIL Z>Y
  END WHILE
  PRINT W
  PRINT X
  PRINT Y
  PRINT Z
STOP
    
```

Translate the following pseudo code into a flowchart.

(8 marks)



10 Correct symbols with text @ ½
Any 6 correct arrows @ ½

(b) List any two characteristics of Structured programming. (1mks)

Modules or sub-routines
Use of control structures in problems solving

(c) Describe three benefits of structured programming. (3 Marks)

- Breaks (splits) a large program into smaller sub-programs (modules) each able to solve a particular/specific problem
- Structured programs are easier to read
- They are easy to code and run
- Programs are easy to modify because; a programmer can change the details of a section without affecting the rest of the program
- Modules are easy to test & debug (i.e correct mistakes/errors). This is because; each module can be designed, coded & tested independently
- It is easier to document specific tasks.
- Use of modules can be named in such a way that, they are consistent & easy to find in documentation
- It is flexible.

(d) List four selection control structures used in writing a program (3mks)

- IF...THEN
- IF...THEN...ELSE
- Nested IF
- CASE ...OFF

17. Q17 (a) Using six bits, find the two's complement of -23_{10} . (2 marks)

$$\begin{array}{ll}
 23 \div 2 = 11 \text{ R}1 & \\
 11 \div 2 = 5 \text{ R}1 & 23_{10} = 010111_2 \\
 5 \div 2 = 2 \text{ R}1 & \text{Twos compliment} = 101000 \\
 2 \div 2 = 1 \text{ R}0 & \quad \quad \quad \underline{\quad + 1 \quad} \\
 1 \div 2 = 0 \text{ R}1 & \quad \quad \quad 101001_2
 \end{array}$$

(b) Perform the following binary arithmetic giving the answers in decimal notation

(i) $1110.0111 + 1101001.011$ (1 ½ mark)

$$\begin{array}{rcl}
 1110.0111 & & \\
 \underline{1101001.0110} & & \\
 1110111.1101 & = & 119.8125
 \end{array}$$

(ii) $1001011.011 - 111.111$

(1 ½ mark)

$$\begin{array}{r} 1001011.011 \quad 67.5 \\ = \underline{111.111} \\ 1000011.100 \end{array}$$

(c) Explain **two** ways in which a computer can represent a positive and negative number 2mks

Positive number — Uses an extra (0) bit

Negative number — uses an extra (1) bit

(d) A particular computer stores numbers in a single 8 - bit word. How would it represent 0.3125_{10} ? (2 marks)

$$\begin{array}{ll} 0.3125 \times 2 & = 0.6250 \\ 0.6250 \times 2 & = 1.25 \\ 0.25 \times 2 & = 0.50 \\ 0.5 \times 2 & = 1.00 \\ & 1.0101_2 \end{array}$$

(e) Perform the decimal subtraction $14_{10} - 6_{10}$ using:

(i) Regular binary

(2 marks)

$$\begin{array}{r|l|l|l|l} 2 & 14 & 0 & = 1110_2 & 2 & 6 & 0=0110_2 = & 1110 \\ 2 & 7 & 1 & & 2 & 3 & 1 & \underline{0110} \\ 2 & 3 & 1 & & 2 & 1 & 1 & 1000_2 = 1000_2 \\ 2 & 1 & 1 & & & & & \end{array}$$

(ii) One's complement of $6_{10} = 1001$

(2 marks)

$$\begin{array}{r} \text{Therefore} \quad 1110 \\ 1001 + \\ (1)0111 = 0111_2 \end{array}$$

Overflow bit

(f) Convert the Hexadecimal number ABCD to octal

(2mks)

$$\begin{array}{ll} A = 10 = 1010 \\ B = 11 = 1011 \\ C = 12 = 1100 \\ D = 13 = 1101 \end{array} \quad \checkmark 1\text{mk}$$

$$\begin{array}{c|c|c|c|c|c} 001 & 010 & 101 & 110 & 001 & 101 \\ \hline 1 & 2 & 5 & 7 & 1 & 5 \end{array} \quad \checkmark 1\text{mk}$$

$$\text{Therefore } ABCD_{16} = 125715_8 \checkmark 1\text{mk}$$

18. (a) Briefly describe the following as used in networking. (4mks)

(i) Repeaters.

- This is a device that receive a signal from one segment of a network then remove any distortion, boost it and send it to another segment

(ii) Network hub

- Connects computers on a network and is able to relay signals from one computer to another on the same network

(iii) Fibre optic cables

- Is a data communication media that utilizes light to transmit data from one point to another on the network

(iv) Network Interface Card (NIC)

- Is a communication device that create physical link between the computer and the transmission media

(b) Communication media can be classified into guided media or Unguided media. List any TWO examples in each case (2 marks)

-Two wire open lines cable

-Twisted pair cables

-Coaxial Cables

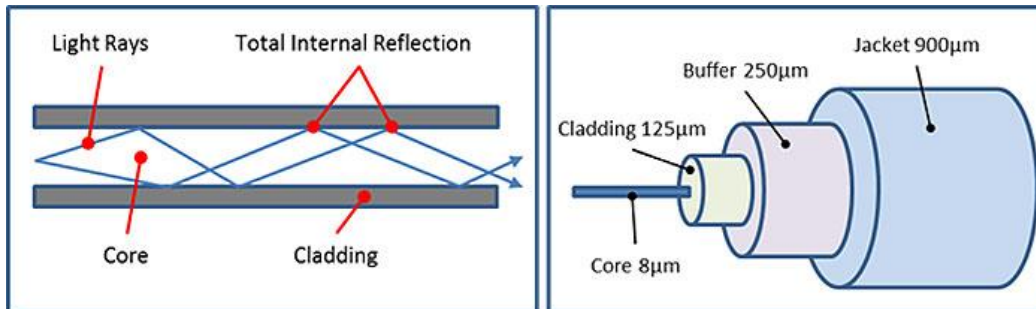
-Fibre Optic Cables

-Radio waves

-Microwaves

-Infrared

(c) Using an illustration, explain how fibre optic cable transmits data. (4 marks)



-Light pulses carrying data are projected into the cable at the source in such a manner that the angle of incidence is greater than the critical angle of the core. The light in the core tries to penetrate total cladding. Since the cladding is of higher refractive index, total internal reflection occurs. The light is kept within the core, bouncing off the boundary of the core and cladding until it reaches the destination as shown.

(d) (i) List any TWO hardware devices that make up a bus network. (2 marks)

-The bus (backbone)

-Terminator

-Terminals (nodes)

(ii) State TWO disadvantages of bus networks. (2 marks)

-If a cable breaks in any one section of the bus it will bring down the entire network.

-The more the number of computers connected to the bus, the higher the chances of collision hence, the more the delays in data transmission.

- ▶ The cable length is limited. This limits the number of network nodes that can be connected.
- ▶ This network topology can perform well only for a limited number of nodes. When the number of devices connected to the bus increases, the efficiency decreases.
- ▶ It is suitable for networks with low traffic. High traffic increases load on the bus, and the network efficiency drops.
- ▶ It is heavily dependent on the central bus. A fault in the bus leads to network failure.
- ▶ It is not easy to isolate faults in the network nodes.
- ▶ Each device on the network "sees" all the data being transmitted, thus posing a security risk.

(e) Define the term network topology. (1mks)

Network topology refers to the arrangement of the computers, printers and other equipment connected on the network.

19. a) Distinguish between the following types of database models. (6 marks)

- i. Network database: It allows a data element (or record) to be related to more than one other data element/record. Links are used to express the relationship between different data items forming a network of items.
- ii. Relational database: Related data items are stored or organized together in structures called relations or tables. Each table consists of rows and columns.
- iii. Flat file database: It holds only one set of data
- iv. Hierarchical database: The data items are organized in hierarchical (tree-like) structure. The records are stored in multiple levels, where units further down the system are subordinate to the ones above

(b) Explain the following terms as used in system implementation (4 mks)

(i) parallel running

This is where both the existing and the new systems are run concurrently/simultaneously (at the same time) for a period of time until users have gained confidence in the new system. Data is processed on both systems in order to compare their performance, and also cross check the results.

ii) Direct change over

This is a complete replacement of the existing system with the new system in one bold move. The existing system is stopped & abandoned and the new system starts operating immediately.

(c) i) Define the term normalization as used in database design. (2mks)

Normalization is the process of trying to eliminate storage of duplicate values in a database.

ii) State three purpose of normalization. (3mks)

- To relate different tables in a database
- To ease the retrieval of data from a relational database
- Breaking up multi theme tables into smaller workable tables

20. (a) State **three** advantages of using computer in education (3 marks)

- Safe cost
- Efficiency
- Vast reference materials
- Make learning interesting

(b) Explain **two** ways in which ICT can enhance business (2 marks)

- Through better advertisement on the internet
- Through better services in retail shops via point of sale terminals
- Through electronic funds transfer

(c) Briefly explain **two** ways on how information & communication technology (ICT) can be used to reduce the spread of HIV/ AIDS (2 marks)

- Through advertisements on the Internet
- Through creation of posters
- Through discussion groups on the internet

(c) Explain the following electronic data processing modes giving relevant examples Where

they are used.

(i) Real time processing.

(2mark)

- The computer processes the incoming data as soon as it occurs, updates the translation files and gives the immediate response that would affect the even as it happens
- The main purpose of a real-time processing is to provide accurate up-to-date information hence better services based on a true (real) situation e.g. making reservation for airline seats i.e. booking through remote terminal the information is given immediately by the reservations

(ii) Distributed data processing.

(2mark)

- refers to dividing processing tasks to two or more computers that are located on physically separate sites but connected by data transmission media. The distributes of processing increases efficiency and the speed of processing e.g. in banking industry where customers accounts are operated on servers in the branches but all the branch accounts can be administered centrally from the main server as if they reside on it.

(d) Explain how computers are used in

(i) Banking

(2 marks)

- helps to aid financial transactions that is recording deposits, withdrawals, cheques clearing and processing and also electronic funds transfers

(ii) Law enforcement

(2 marks)

- Use of biometric device that identify people through human biological characteristics such as fingerprints, voice, lips, facial features

NAME:.....ADMI. NO:.....
SCHOOL:..... CANDIDATE SIGN:.....
DATE.....

451/2
COMPUTER STUDIES
PAPER 2
(PRACTICAL)
JULY/ AUGUST- 2014

TIME: 2 ½ HOURS

LAINAKU PRE-MOCK EXAMINATION 2015
Kenya Certificate of Secondary Education (K.C.S.E)

COMPUTER STUDIES
PAPER 2
(PRACTICAL)
MARCH/APRIL 2015
MARKING SCHEME

Marking scheme

TIME: 2 ½ HOURS

Instructions to candidates.

- This paper consists of two questions. Answer **both** questions.
- All questions carry equal marks.
- Indicate your name and index number at the top right hand corner of each printout.
- Write your name and index number on the CD provided.
- Write the name and version of the software used for each question attempted.
- Passwords should not be used while saving.
- Make a print out of the answers on the answer sheet.
- Hand in all the print out and the CD.

This paper consist of 4 printed pages.

Candidate should check the question paper to ascertain all pages are printed as indicated

And no questions are missing.

1. a) Enter the data below as it is into a worksheet and save the file as ‘Marathon Exam’ (10 mks)

ADM. NO.	Name	English	Maths	Biology	Chemistry	Physics	History
6058	Victor Okale	78	62	72	56	72	90
6020	John Mwangale	58	72	50	48	40	82
5080	Peter Mutai	80	56	82	42	95	72
5040	Mark Kamau	50	78	77	70	83	68
6060	James Jaro	60	66	90	50	58	74

✓ Correct column heading labels $8 \times \frac{1}{2} = 4$

✓ Accurate data entry per row $5 \times 1 = 5$

✓ saving with Correct file name = 1

- b) Use appropriate formula to;

i) Get the total score for each student

✓ $(5 \times \frac{1}{2} = 2 \frac{1}{2} \text{ mks})$

ii) Calculate mean score for each student

✓ $(5 \times \frac{1}{2} = 2 \frac{1}{2} \text{ mks})$

iii) Obtain the mean for each subject

✓ $(6 \times \frac{1}{2} = 3 \text{ mks})$

- c) Format the worksheet as follows

(4mks)

i. Borders : Outline is double line, inside is single line

✓ (1 mk)

ii. Subject heading : align 90°

✓ (1 mk)

iii. Marge the cells above all the subjects headings and type the title ‘SUBJECT’

✓ (1 mk)

iv. Mean score : One decimal place

✓ (1 mk)

- f) Copy the contents of the worksheet to a blank worksheet

✓ (2 mk)

- g) Insert a blank column after every subject and put the title “Grade” in the inserted columns (3 mks)

(correct column insertion and title $6 \times \frac{1}{2} = 3 \text{ mks}$)

- h) Use the grading system below to generate subject grades for all students

(9mks)

Mean score

Grade

score ≥ 75

A

$60 \leq \text{score} < 75$

B

$50 \leq \text{score} < 60$

C

$45 \leq \text{score} < 50$

D

Score < 45

E

Correct formulae on top columns $6 \times \frac{1}{2} = 3$

Correct argument used per column per formula $6 \times \frac{1}{2} = 3$

Correct cell referencing per column $6 \times \frac{1}{2} = 3$

- i) Create a column chart to compare students mean score. Remove all the gridline and place data

labels on top of every bar

Correct chart = 2

Appropriate proportional scale used = 2

Gridlines removed = 2

Data labels placed on top of the bar = 2

Correct selection of data = 2

(10mks)

j) Print the two worksheets and the bar chart $2 \times 2 = 4$ (4mks)

2. a) Preparing the document using Pagemaker or DTP, award(15 marks)

b) West glory center, size 16 award.....(1 mark)

b) Mwangaza paper, Times new Romans size, award.....(2 marks)

c) Insertion of two clip art(2 marks)

placement in relation to the triangle..... (1mark)

d) Underlining relevant, business and limited..... (1 mark)

e) working hours....size 20..... (1mk)

Caps...1/2 mark a.m, p.m.....(1 mk)

All days underlined.....(1mk)

Fill pattern for working hours is 5%.....(1mk)

Border line style (square dot).....(1mk)

Our offices...centered at the bottom.....(1mk)

f) Creating table with text award (10 mks)

Text direction..... (2mks)

Shading of titles by bolding..... (1mk)

Bolding of titles..... (1mk)

Typing all the text..... (5 mks)

Border appearance..... (1mk)

g) Printing the document award..... (2 mark)

