

KAPSABET HIGH SCHOOL

Instruction to Candidates.

- (a) Write your Name and Index Number in the spaces provided at the top of this paper.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) This paper consists of **TWO** sections; **A** and **B**.
- (d) Answer **ALL** the questions in Section **A**.
- (e) Answer question **16** and any other **THREE** questions from Section **B**.
- (f) All answers should be written in the spaces provided on the question paper.
- (g) This paper consists of 16 printed pages. Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

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Section	Question	Score
A	1 - 15	
B	16	
	17	
	18	
	19	
	20	
TOTAL		

Section A (40 Marks)

Answer ALL Questions from this section

1. State three reasons why it is difficult to control, detect and prevent computer crimes (3marks)
 - ***It require well trained expertise which may not be available***
 - ***Crimes constantly change***
 - ***Some leave no evidences***
 - ***Some crimes can not be linked to an individual or organization.***
2. Mr. Kala wants to buy a printer to use in his automobile workshop for printing sales orders in duplicates. He has approached you for advice. What printer should he buy? (1 Mark)

Dot matrix printer

Give a reason for your answer. (1mark)

Can produce multiple copies with a carbon paper

3. Last year 2020 when corona virus was declared a pandemic internationally most companies allowed employees to telework or work at home and communicate with the office using the Internet. List the hardware, software and services required to access and use the Internet.

(3 Marks)

- **Data terminal**
- **Transmission media**
- **Internet service providers**
- **Internet s/w**

4. Using a well labelled diagram, describe the fetch and execute cycle. (3 Marks)

1. **Fetch** – gets the next program command from the computer’s memory
2. **Decode** – deciphers what the program is telling the computer to do
3. **Execute** – carries out the requested action

5. Ventilation is an important practice in the computer lab because it enhances proper circulation of air. Outline **three** ways in which air is regulated in the computer room. (3 marks)

- **Avoiding overcrowding of either machines or users in the room**
- **Ensuring that the room has enough ventilation points like windows**
- **Installing air conditioners**

6. Differentiate between COM ports and LPT ports. (2 marks)

- **COM ports are used for serial cables**
- **LPT ports are used for parallel cables connection**

7. State any two advantages of the artificial intelligence. (2 Marks)

- **Reduction in Human Error**
- **Helping in Repetitive Jobs**
- **AI machines have no emotions**
- **Round-the-clock availability**

8. The word COM appears several times in an essay. Jane would like to change the word to COMPUTER. Advise her on

9. how she can accomplish this task using a word processor. (2 Marks)

- **The word can be edited with Find and Replace**

10. Anita was working on her computer studies project. She was worried of the media to use for storing her data. She settled on a media that used serial file organization. How are files organized on a storage medium using this method? (1 mark)

- **Serial file are stored and accessed one after another on a storage medium**

(b) List two advantages offered by this type of file organization. (2marks)

Advantages – **simple, cheap**

11. (a) Rose wants to send an email to Jack. Explain two items that must be present for the mail to be sent. (2

Marks)

-senders address

-Receivers address

-Content

(b) (i) Define the term network protocol (1

Mark)

- **Set of rules and procedures that govern how computers and related devices communicate and transfer data signals**

(ii) Name any **two** examples of network protocols (1

Mark)

○ **TCP/IP**

○ **FTP**

12. (a) What is the importance of layering in DTP? (1 Mark)

- **creating a sense of page harmony**

- **increases productivity**

-**For the purpose of editing, working with layers allows for applying changes to just one specific layer.**

(b) Distinguish between column guides and margin guides as used in DTP. (2 Marks)

- **Margins a non-printing line that marks the boundary of the top, bottom, right and left margins while column guide is non-printing line that marks the boundary of a column on a page**

12. Study the work sheet below and answer the questions that follow:

	A	B	C	D	E	F
1						
2	MOKASA MIXED HIGH SCHOOL					
3	ADM. NO	NAME	MATHS	ENGLIS H	AVERAG E	RANK
4	1001	Akinyi	78	85		
5	1002	Kamau	89	77		
6	1003	Leila	45	46		
7	1004	Taita	67	69		
8	1005	Mosomtan y	98	67		
9	Highest Score					
10	Lowest Score					
11	Average Score					

(a) Write a formula that would be entered in cell E4 to compute the average score for Akinyi. (1

Mark)

=(c4+d4)/2 or =average(c4:d4)

(b) Write down a formula that used to return the rank of Leila based on average score. (1

Mark)

=RANK(F6,\$F\$4:\$F\$8,0)

(c) Write down a formula that would return the number of students whose score in English is below 70. (1

Mark)

=COUNTIF(E4:E8,"<70")

13. The manager of a company wants to improve the security of the computer network. She has decided to use authentication techniques so that employees can identify themselves to the system. Name **two** authentication techniques and describe how each technique would help keep the data more secure.

(3 Marks)

- *Use of biometric methods ie finger prints*
- *smart cards or hand-held tokens*

- *password or a simple personal identification number (PIN)*

14. Mary who works as a systems analyst for JeroKin investments has produced documentation for a newly developed system. State three reasons why both user and technical documentation are needed. (3 Marks)

Technical - presents how to use and maintain the product.

User – explains exactly how to use the software

15. Environmentalists plan to test a fast flowing river for pollution. State two advantages of using a computer to do this rather than doing it manually. (2 Marks)

a) facilitates a detailed analysis of test results with minimal effort.

b) Immediate Grading results are obtained...

SECTION B (60 MARKS)

Answer question 16 (Compulsory) and any other THREE questions from this section.

16. To maintain a strategic fit safaricom is introducing a tariff called the mega tariff that will lower costs to safaricom to safaricom calls and calls to other networks. Calls to safaricom networks will be charged according to the time of the day as listed below:
- Between 8am to 12 noon-6 Kshs
 - Between 12 noon to 2 pm-0.8 Kshs
 - Between 2 pm to 6 pm-2 Kshs
 - Between 6 to 1 am-4 Kshs
 - Between 1 am to 8 am-1 Kshs

Internal calls to other networks are charged at a fixed rate of 7 Kshs between 8am to 8 pm and to while international calls are charged at a rate of 25 Kshs between 8 am to 8 pm and Kshs 35 for the rest of the day. All calls are charged per minute usage.

Mr. Wasswa Bbaale a business man who makes both internal and external calls would like to make maximum use of this tariff.

- (a) Write a pseudo code that would show him know the charges of calls with an appropriate label when he inputs type of call and the time where appropriate. Use a 24 hour clock.

START

```
    READ calltype
    CASE calltype OF
        "Safaricom":
            READ time
            CASE time OF
                8 to12: charge=6
                12 to14: charge=0.8
                14 to 18: charge=2
                18 to 1: charge=4
                1 to 8: charge=1
```

ENDCASE

```
        "Other Networks":
            Charge=7
        "International":
            READ time
            CASE time OF
                8 to 20: charge=25
            ELSE
                Charge=35
        ENDCASE
```

ENDCASE

PRINT "call on mega onega now at,"charge,"shillings per minute on safaricom to",
calltype,"calls"

STOP

Note: Award marks as follows

Input- ½ calltype, ½ time=1 mark

Output- ½ for output, ½ for appropriate label=1 mark

Logic – selection construct= ½

Decision (proper branching)-1 mark for 3 correct selections – ½ for two selections =1 mark

Process

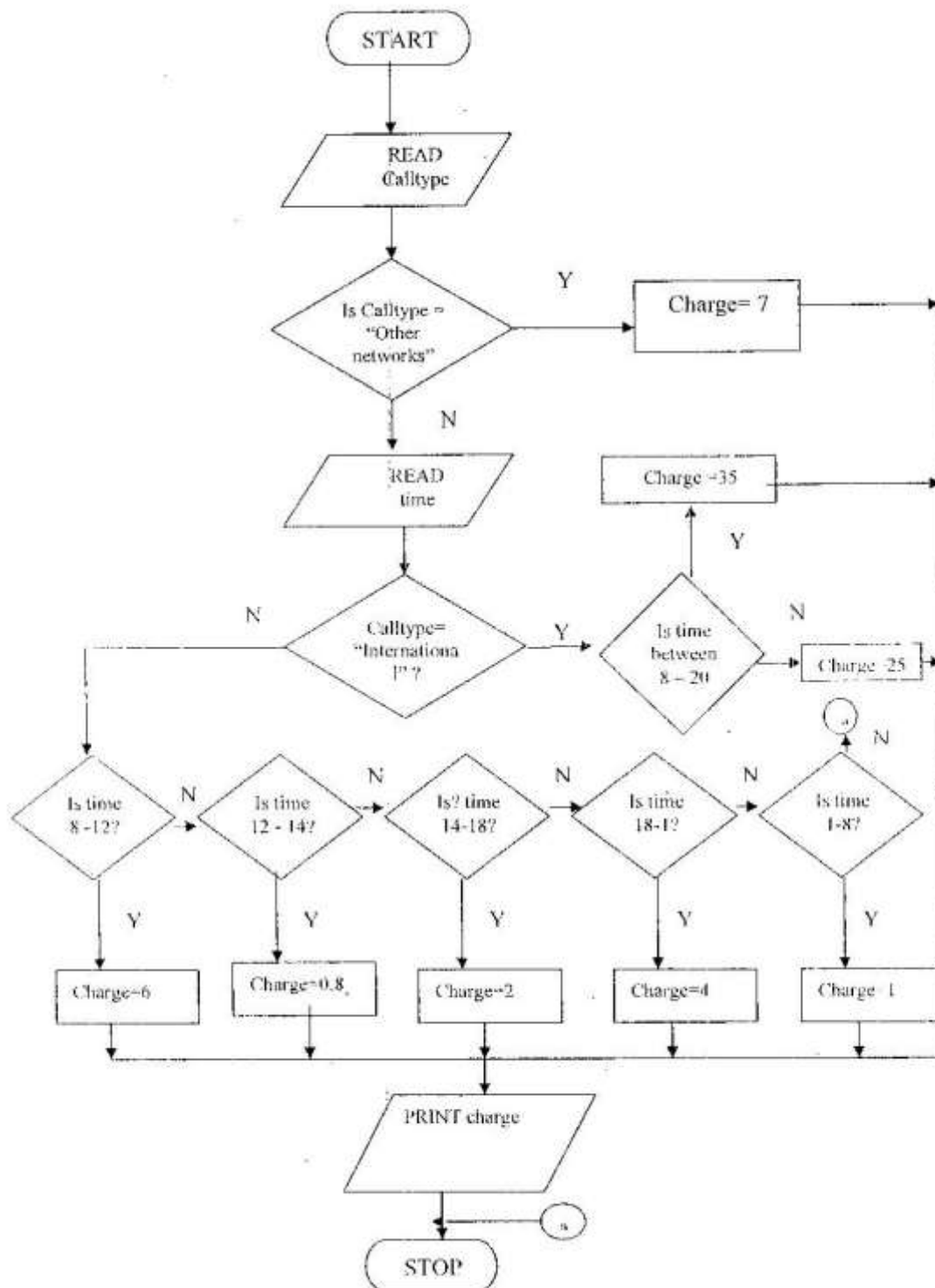
-International calls-1

-Calls to other networks – ½

-Safaricom calls- 2½

Use of 24 hour clock- ½ Mark

(b) Design a flowchart for the pseudocode in 16 (a) above (7 marks)



Note: award marks as follows

Correct symbols – ½

Start /stop symbols - ½

Input – ½

Output – ½

Correct logic – ½

Correct use of symbols – ½

Decisions

-Based on calltype – ½

-Based on safaricom to safaricom calls-2

-Based on international calls- 1

-Based on calls to other networks- ½

17. (a) Explain how an operating system controls I/O devices. (2 marks)
The operating system manages the use of input and output devices. This is done by the use buffers .The operating instructs input and output buffers to take inputs from an input device or to take outputs from the processor while the process using the input or output is suspended .when the process which needs the input is made active once again, the operating system will command the buffer to send data.
- (b) Maintaining security is one of the functions of the operating system. Explain how the operating system maintains security.
Maintaining security-in networks and larger computers each user is given a username or ID and passwords to gain access to the computer system. the operating system keeps a register of all the names so that the only persons with valid usernames or IDs passwords can access the system. The operating system keeps a log which records users logged in, the length of time each user stayed in the system and what they did.
- (c) Distinguish between the following pairs of terms
- (i) **Indexed sequential and direct file organizations**
In direct access the computer can go directly to the record you want without reading the preceding records. For example, to access a record, the computer goes directly to it without having to go through what is in in front of it. In indexed sequential file organization the records are stored in a particular order using a key file. However the file in which the records are stored contains an index that lists each record by its key field and identifies its physical location on the disk. The records in an indexed sequential file can either be accessed directly or sequentially (one after the other).
- (ii) State any **TWO** factors to consider when selecting a data processing mode
- **Link between applications**
 - **Area of application**
 - **Volume of data to be processed**
 - **Urgency of output**
- (d) (i) Using appropriate examples, differentiate between distributed and centralized processing modes. (3 marks)
Distributed processing modes is a mode of processing where two or more geographically dispersed networked computers belonging to the same organization share all or some processing tasks whereas centralized processing is

- (c) Convert 11011011111.1111₂ to:
 (i) Octal (2 marks)

Group the bits in to threes

011 011 011 111 .111 100	-	1 mark
3 3 3 7. 7 4	-	½ mark

= 3337.74₈ - ½ mark

- (ii) Hexadecimal (2 marks)

Group the bits in to fours

0110 1101 1111. 1111	-	1 mark
6 D F F	-	½ mark

= 6 DF 16 - ½ mark

- (iii) Decimal (2 marks)

11011011111.1111

$2^{10} + 2^9 + 2^7 + 2^6 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 + 0.5 + 0.25 + 0.125 + 0.0625$ - 1 mark

$1024 + 512 + 128 + 64 + 16 + 8 + 4 + 2 + 1 + 0.9375$

= 1759.9375₁₀ - 1 mark

- (d) State any two methods used to gain access to a computer system. (2 marks)
 - **by using weak access points**
 - **through hacking**

- (e) (i) Distinguish between peer to peer client server LANS (2 marks)
Client server LAN is a LAN that consists of requesting computers called clients and a computer that provides services to the clients called the server.
Peer to peer LAN is a LAN where all the computers on the network communicate with one another directly without relying on the server.

- (ii) Atieno was very happy when she bought a safaricom 2G modem for she was able to easily connect her computer to the internet. After six months she noticed it was taking her too long to connect to the internet .State two possible causes of the problem. (2 marks)
 - **Many people may be using the same band**
 - **The bandwidth she is using is narrow.**

19. (a) (i) Explain any **TWO** causes of system change. (2 marks)
- Errors in the system*
 - Change in user requirements*
 - Expansion /growth of the organization*
 - Technological changes*
 - Frequent failure of the system*
- (ii) Explain any **THREE** causes of system maintenance (2 marks)
- High failure rate of the existing system*
 - Slowness of the system*
 - Complaints from users*
 - Lack of security*
 - High cost of maintenance*
- (b) (i) Use of questionnaire is one of the most popular fact finding methods .State any **TWO** advantages and **TWO** disadvantages of using this method to gather data. (2 marks)
- Advantages
- Most questionnaires can be answered quickly*
 - Responses can be tabulated and analyzed quickly*
 - It is an inexpensive method of fact finding*
- Disadvantages
- The number of respondents is usually low*
 - There is no guarantee that an individual will answer all the questions*
 - Questionnaires are inflexible.*
- (ii) Explain the importance of requirement specification phase of system development
It enables the systems analyst determine the equipments needed for the new system.
- (c) Explain **TWO** reasons why a new system is tested before implementation.
- To detect and remove bugs (errors)*
 - To ensure the program works properly*
 - To ensure the program solves the intended problem*
- (d) (i) State **TWO** duties performed by a systems administrator
- Installing and configuring servers*
 - Installing and configuring application software*
 - Creating and maintaining user accounts.*
 - Backing up and restoring files*
 - Monitoring and improving system performance*
 - Configuring a secure system and maintaining system security.*
- (ii) The principal of a school is attempting to convince his staff to use CAL and CAI software .State one benefit and one limitation of using such software. (2 Marks)
- Benefits
- *They use multi media that make learning more interesting and interactive*
 - *Students can learn on their own and at their own pace even in the absence of a teacher.*

- *Abstract concepts can often be explained more clearly with the use of a multimedia*

Limitations

- *It reduces face to face interaction with others*
- *Lessons are set in a predefined order and students can only -- follow in that order thus hindering creativity.*

- (e) State **ONE** advantage and **ONE** disadvantage of using expert systems in medicine
(2 marks)

Advantages

- *Experts can use the system to arrive at a faster, more accurate conclusion*
- *It can support a doctor who is doubtful of his decision because of lack of experience.*

Disadvantage

- *The system cannot learn from its mistakes*
- *Lack instinct and common sense which are essential for decision making*

20. (a) Explain **THREE** types of communication links that may be used to get an internet connection.
- *Dedicated links-this provides permanent connection to the Internet*
 - *Remote network access-this provides access to the internet via satellite dish*
 - *SLIP/PPP (serial line internet protocol /point-to-point protocol)-to get access to the internet, one must dial up an internet service provider which gives you access to the internet.*

- (b) (i) Differentiate between the internet and World Wide Web (2 marks)
The internet is a network of networks that connect computers across the world while the World Wide Web is a part of the internet that which stores information in multimedia form.

- (ii) Technology has been blamed for polluting the environment .Explain how the computer technology has contributed to this. (2 marks)
- *The use of solvents in the manufacturing of computers can harm the environment.*
 - *Disposal of old and used computer parts are harmful to the environment because they do not decompose.*

- (c) A company that makes and sells vehicles receives orders from various clients .the Company wants to enter their orders in to a database. Study the table structure below and answer the questions that follow.

<u>Field name</u>	<u>data type</u>	<u>field size</u>
Order number	number	long integer
Order date	date/time	
Supply date	date/time	
Product code	text	5
Consumer ID	number	long integer
Customer FName	text	15
Customer Lname	text	20
Customer phone	number	long integer
Delivery address	text	30
Product type	text	15
Product name	text	10
Quantity ordered	number	long integer
Product prize	number	long integer

- (i) Split the above table structure in to THREE tables and for each table identify an appropriate primary key. (5 marks)

Order table

<u>Order number</u>	number	long integer
Order date	date/time	
Ordered quantity	number	long integer
Supply date	date/time	

Primary key: order number

Customer table

<u>Customer ID</u>	number	long integer
Customer FName	text	5
Customer LName	text	20
Customer phone	number	long integer
Delivery address	text	30

Primary key: customer ID

Product table

<u>Product code</u>	text	5
Product type	text	15
Product name	text	10
Product prize	number	long integer

Primary key: product code.