

END TERM EXAMINATIONS – TERM TWO 2023

**Form Four
Computer Studies**

Paper 1

Marking Scheme

1. The principal of a school is concerned that students may be hacking into the exam score database to change their marks. Other than password state three ICT methods that could be used to prevent this from happening
 - **Use of finger print**
 - **Use of smart cards**
 - **Use face recognition**

Award 1mark each max 3

2. Describe the components of a spreadsheet function
 - **Equal sign (=) mark the beginning of a function**
 - **Function Name describe the activity to be performed**
 - **Argument the range of values to be acted upon**

Award 1mark each max 3

3. Explain the term prototyping as used in system development
 - **Prototyping is defined as the process of developing a working replication of a product or system that has to be engineered. It offers a small-scale facsimile of the end product and is used for obtaining customer feedback.**

Award 2marks max 2

4. The Director of a private school based in Nairobi has decided that the school magazine will now be included in the school website. Give three reasons why the Director thinks it is a good idea to replace the paper version with a website version
 - **Relatively cheap**
 - **Reach many people**
 - **Flexible**
 - **Ease of modification**

Award 1mark each max 3

5. Describe three operational factors the system analyst need to consider in hardware and software requirement during requirement specification phase
 - **Reliability- choose hardware and software that will support the operations of the system without crashing or hanging**
 - **Compatibility- consider hardware and software that work with the system without conflict**
 - **Upgradeability – Hardware and software that will accommodate changes in technology**

Award 1mark each max 3

6. Reckless uses a memory stick to transfer her work from school to home. Give three reasons why memory stick are often preferred to CDs for storing work
 - **Have mass storage**
 - **Fast data access and retrieval**
 - **Do not suffer from mechanical failure**
 - **Exist in different capacities**

Award 1mark each max 3

7. Describe three ways in which a computer program can be maintained
 - **Preventive maintenance- adjustment made to a program to prevent errors from occurring**

- **Corrective maintenance** –Changes incorporate to correct errors experienced by the program
 - **Adaptive maintenance** – changes that allow a program to be compatible with new changes like technology or operation platform
 - **Perfective Maintenance** -Adjustment to improve the functionality of the program
Award 1mark each max 3
8. Give three reasons to justify why Safaricom , Airtel and Telkom have intensively used repeaters in their networks
- **To expand the network**
 - **Amplifies signals**
 - **Receives signals from one network segment and retransmit to another network segment**
Award 1mark each max 3
9. List four Mechanical devices that were used for counting before the electronic computers
- **Abacus**
 - **Pascaline**
 - **Slide rule**
 - **Weaving loom**
Award 1mark each max 3
10. Describe two ways of creating or manipulating text in Ms-Publisher and Adobe PageMaker
- **Using text tool** – Ms-publisher provide a textbox which acts as text tool while Adobe PageMaker provide a text tool. Both allows the user to insert text in the publication
 - **Using Text frame-** by using a frame tool or by converting any object created with a drawing tool except the line
Award 1mark each max 2
11. Name three benefits accrued from utilizing ICT platforms in industrial systems like Process control
- **Efficient utilization of raw materials**
 - **Improved productivity**
 - **Leads to production of high quality goods**
 - **Streamlines the relationship between the company , customers and suppliers**
 - **Expand the range of what can be produced**
Award 1mark each max 3
12. Describe three functions of antivirus program
- **Prevent computer virus from attacking a computer**
 - **Delete virus from the computer**
 - **Detect the existence of a virus in a computer**
Award 1mark each max 3
13. A finance company uses cloud storage to archive their accounts. Describe three advantages of using platform
- **Cloud have massive storage where large volumes of data can be stored**
 - **Cloud environment is flexible and therefore data can be accessed from any point at any time provided there is internet connectivity**
 - **Cost effective since one only need to have network connectivity and the cloud account which require very little amount of money**
 - **Cloud storage have well-structured security features and therefore the service provide extend this to users to ensure that their files are safe**
Award 1mark each max 3

14. Explain the line of sight principle in data communication

- **Line of sight is a type of propagation that can transmit and receive data only where transmit and receive stations are in view of each other without any sort of an obstacle between them**
Award 2marks max 2

15. The Kenya Universities and Colleges Central Placement Service (KUCCPS) is a State Corporation that provides career guidance and selects students for admission in Universities and Technical Training institutes. Describe two types of Universities that KUCCPS can place students to pursue undergraduate courses in Kenya

- **Public university is created by state and run state appointed management team while private university is set up by individuals, churches or any other organization**

Award 1mark each max 2

16.

(a) Give four guidelines a programmer should follow in order to design a good pseudo code

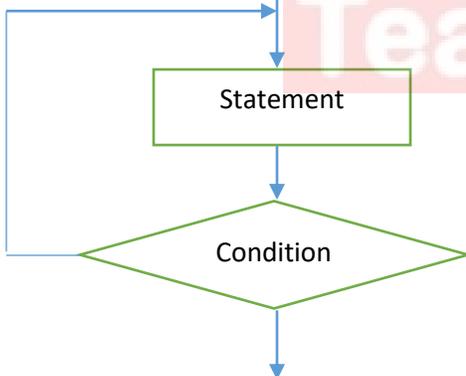
- **Statement must be clear , short and readable**
- **The statements must have one meaning**
- **The pseudo code must be clearly outlined and indented clearly**
- **The start and stop must clearly be shown**
- **Keywords must be used to show the input, output and processing activities**

Award 1mark each max 4

(b) Describe the following looping structures

(i) **Repeat.... Until**

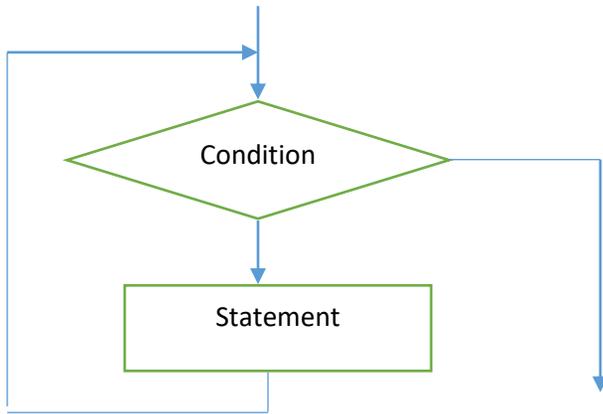
- **In Repeat until execution takes place before a condition is tested**



Award 2marks max 2

(ii) **While.... Do (2marks)**

- **In While Do execution only takes a place when a condition has been tested and evaluates to true**



Award 2marks max 2
Accept well labelled diagram

- (c) Maranda High school pays casual employees based on the number of hours worked. The payment schedule is as shown below.

- ✓ Less than 10 hours @500 per hour
- ✓ Up to 15 hours @700 per hour
- ✓ More than 15 hours @900 per hour

Write a pseudo code that will prompt the user to key the Name, Number of hours worked and then compute the total wage for five employees

Start

Count = 1

Wage = 0

While Count =< 5 Do

Enter Name, Number of hours worked

IF Number of hours worked <10 Then

Wage = Number of Hours Worked *500

Else

If Number of Hours Worked <10 and Number of Hours Worked <15 Then

Wage = Number of Hours worked* 7000

Else

Wage = Number of Hours worked *900

Endif

Endif

Wage = Wage+Wage

Count =Count+1

Endwhile

Display Wage

Stop

Start = $\frac{1}{2}$
Stop = $\frac{1}{2}$
Initialization Wage 0 and Count = 1 = 1
Condition 1 = $\frac{1}{2}$
Condition 2 = $\frac{1}{2}$
Condition 3 = $\frac{1}{2}$
Condition 4 = $\frac{1}{2}$
Computation of wage = $\frac{1}{2}$
Increase the count = $\frac{1}{2}$
Display wage = 1
Logic = 1



17.

(a) Convert the following numbers to Decimal number system

(i) 010011.10001_2 (3marks)

$$\begin{array}{cccccccc}
 0 & 1 & 0 & 0 & 1 & 1 & . & 1 & 0 & 0 & 0 & 1_2 \\
 0 & 16 & 0 & 0 & 2 & 1 & & 0.5 & 0 & 0 & 0 & 0.03125
 \end{array}$$

$$19 + 0.53125 = 19.53125_{10}$$

(ii) 36.5_8 (3marks)

$$\begin{array}{l}
 36.5 \\
 3 = 011 \\
 6 = 110 \\
 5 = 101
 \end{array}$$

$$\begin{array}{cccccccc}
 0 & 1 & 1 & 1 & 1 & 0 & . & 1 & 0 & 1 \\
 4 & 3 & 2 & 1 & 0 & & 0.5 & 0 & 0.125 & 0.625
 \end{array}$$

$$16 + 8 + 4 + 2 + 0 = 30$$

$$30.625_{10}$$

(b) Evaluate $1010_2 + 1010_2 - 1001_2 + 00010_2 - 1101_2$ (3marks)

$$1010 + 1010 = 10100 - 1001 = 1011 + 00010 = 1101 - 1101 = 00000$$

(c) Use 8 bit scheme and Twos complement to subtract 50_{10} from 40_2 , write your answer in decimal notation (4marks)

$$50 = 00110010$$

$$40 = 00101000$$

$$\begin{array}{r}
 00110010 \\
 11001101 \text{ IC} \\
 11001101 + 1 = 11001110 \\
 \underline{00101000} \\
 11110110 \\
 \underline{\quad -1} \\
 11110101 \\
 00001010 = -10
 \end{array}$$

(d) Describe two reasons for the use of Octal and Hexadecimal number system

- **Automatic data compression which help in saving of the storage location**

- **Improves transmission efficiency**

Award 1 mark each max 2

18.

(a) Apart from Keyboard and Mouse list any other three input devices found at the Point of sales Terminal

- **Magnetic Stripe Reader**
- **Optical Barcode Reader**
- **Finger Print Scanner**
- **QR code scanner**

Award 1 mark each max 3

(b) Describe the functions of the components of VR

(i) Glove

- **Data gloves are worn on the hands to allow the user navigate through the virtual world and interact with virtual objects**
- (ii) Body suit
 - **It is made of conductor wire that senses the body movement and relays the data into the virtual reality system which in turn adjusts the position of user in virtual reality world**
- (iii) Virtual Reality software
 - **A set of instruction responsible for simulation of all the aspects of virtual reality**

Award 1 mark each max 3

(c) Describe four ways in which ICT platforms have improve transport services

- **Booking reservation system allow customers to book from any point at any time**
- **Computer controlled traffic light system used to reduce traffic jams on the roads**
- **E-payment platforms used to pay for bus fare**
- **Use of navigation software to locate places**

Award 1 mark each max 4

(i) Define the term Telecommuting

- **Also known as 'telework' or 'work from home', telecommuting is an arrangement that allows employees to work away from the company's offices.**

Award 2marks max 2

(ii) Give three problems experienced by organization that use this innovation

- **It is difficult to supervise employs from homme**
- **Lack of collaboration between teams in the organization**
- **Having a remote workplace could jeopardize security for the company**

Award 1 mark each max 3

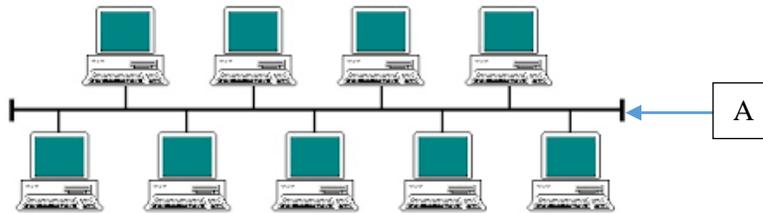
19.

(a) Name three Data Terminal Equipment used in a computer network

- **Modem**
- **Bridge**
- **Router**
- **Printer**
- **Computer**

Award 1 mark each max 3

(b) Use the diagram to answer the questions that follow



(i) Identify the topology represented in the above diagram

- **Bus topology**

Award 1 mark each max 4

(ii) State the function of the part marked A

- **It is used to avoid signals from bouncing back and forth on the cable**

Award 2 marks each max 2

(iii) Name two limitation of this topology

- **Troubleshooting is very difficulty**
- **Breakdown in the main cable brings down the entire network**
- **Limited number of stations can be connected to main cable**

Award 1 mark each max 2

(c) Mention four roles a Network Administrator

- **Track network usage and keeps a log of the people who have used the network**
- **Design the network**
- **Secure the network against unauthorized access**
- **Troubleshoot network related problems**

Award 1 mark each max 4

(d) Describe three main pathways in a computer in which components like ALU, Control unit, Register, Buffer Cache, Main memory use to exchange between them

- **Control bus – Pathway for all timing and controls functions**
- **Address bus – pathway used to locate the storage location in memory for the next instruction to be processed is held**
- **Data bus- Pathway for actual data transfer**

Award 1 mark each max 3

(a) A Secretary of a large Non-Governmental organization based in Nairobi was keying data collected from the field. In the first case the secretary keyed in “braek” instead of break then later keyed in 4596 instead of 4569

(i) Describe two types of errors illustrated above

- **First - Misreading error is brought about incorrect reading of the source document by the user and hence entering the wrong values**
- **Second-Transposition error results from incorrect arrangement of characters**

Award 1 mark each max 2

(ii) State three ways of preventing errors identified in (i) above

- **Data verification**
- **Data validation**
- **Use methods that capture directly from source**

Award 1 mark each max 3

(b) State three major limitations of serial file organization

- **Waste space in form of Inter-Record Gap**
- **Linear access to record makes it cumbersome**
- **Most modern computers do not support this file organization method**

Award 1 mark each max 3

(c) What is normalization in Databases

- **Normalization is a database design technique that reduces data redundancy and eliminates by dividing larger tables into smaller tables and links them using relationships.**

Award 2 marks max 2

(d) State three key functions of primary key

- **Used to uniquely identify records in a database**
- **Create links between multiple tables in a database**
- **Sort data in the table**

Award 1 mark each max 3

A student created a query using fields from multiple tables, when he clicked on the run command the query did not display the dynaset but instead displayed “Type mismatch error”. Describe the cause of this anomaly

- **The fields used to create a relationships have different data type**

Award 2 mark max 2