## 3rd May 2023

## SECTION A

### Question One

a) Define a **computer virus.**
**A computer virus** is a computer program that can spread across computers and networks by making copies of itself, usually without the user's knowledge.

b) Explain the term **softcopy** as used in Information Technology.
**Softcopy** is an intangible (can't be touched) computer resource. It can be viewed on the screen. For example a word document file.
**Note**
**Hard copy** is a tangible computer resource. For example printed document.

c) Differentiate **Bluetooth** and **Wi-Fi** technology.
**Bluetooth** can allow sharing of files locally without any internet connection
**Wi-Fi** allows connection and sharing of information between two devices which requires internet connection.
**Note**
**Bluetooth** is more secure than **Wi-Fi**
**Wi-Fi** covers a wider geographical area while Bluetooth covers a smaller geographical area.

d) Give **one** difference between the **Fourth** and **Fifth generations** of computers.
- Fifth generation computers are faster than fourth generation computers.
- Fifth generation computers have larger storage capacity than fourth generation computers.
- Fifth generation computers have more memory than fourth generation computers.

e) State **two** computer input devices giving **one** function for each.
Keyboard – it is used for inputting symbols, numbers and characters.
Microphone – it is used for inputting sound signals into the computer
Webcam – it is used for inputting live videos into the computer

f) Explain the main function of the **Central Processing Unit (CPU)** to a computer system.
- The **Central Processing Unit** carries out all the processing of the computer operations.
- It also coordinates and controls all the activities in the computer and controls the input/output devices.

## SECTION B

### Question Two

a) Identify **five** symptoms of a computer infected with a computer virus.

- Hardware troubles,
- No response,
- Slow performance,
- Slow start up,
- Crashing,
- Missing files,
- Disks or disk drives are not
- Accessible,
- Extra files,
- Printer issues,
- Unusual error messages

b) Odong and Mugisha studied in lockdown online and completed their course. Give **five** benefits Odong and Mugisha enjoyed while using this platform in their study.
- Studying online gives one time to do other things.
- It saves time because does not need to move to a learning center
- It is also cheap since one does not need to incur transport costs to the learning center
- It gives one chance to study from his/her place of convenience
- Since the teaching is recorded, it gives one chance to revisit the taught content and understand better.

**Question Three**

a) Give **five** functions of an Operating System.
- It provides a user interface. It displays on-screen elements with which you interact
- It loads programs into the computer's memory so that you can use them
- It coordinates how programs work with the computer's hardware and other software
- It manages the way information is stored on and retrieved from disks
- It manages resource sharing
- To provide basic working environment/user interface on a computer.
- To control the use of peripherals (both input and output).
- To control the loading and running of application programs.
- To manage allocation of memory

b) Explain **five** factors to consider when purchasing a printer for your printing needs.
- The **cost** of the printer. This helps the buyer to choose the printer he/she can afford to buy.
- The **speed** of the printer. This is the measure of how fast the printer can accomplish tasks. It is advisable to buy a faster printer because it saves time.
- The **efficiency** of the printer. This the measure of how good the printer is in doing what it is supposed to do.
- The **mechanical condition** of the printer. This decides a lot on the performance of the printer after buying.

**Question Four**

a) Some people praise internet for causing a positive impact to the society. Identify **five** services being offered by such technology in the business sector.
- ✓ **Communication** – internet allows people from different locations to communicate with each other
- ✓ **Digital marketing** – it helps in availing information to the public about the available products in the business for people to view and also make purchase.
- ✓ **Advertisement** – internet can be used to advertise various commodities which creates access to different trading points.
- ✓ **Internet banking** – internet helps in money transactions online through E-banking systems. This helps people to transact internationally.
- ✓ E-**learning** – internet can also be used to conduct learning services for people in different locations. This can be done using applications like zoom.

- ✓ **Entertainment**

b) Explain **five** dangers of the internet to a business.

- ✓ **Virus infections**. One can easily get viruses as a result of using the internet. This may be through downloading infected files or visiting infected sites. Viruses damage computer resources.
- ✓ **Immorality** – this is due to the fact that there are sites on the internet with pornographic content (videos and pictures).
- ✓ **Cybercrimes** – these are done by the bad guys i.e. hackers. These access information they are not allowed to access and may cause unnecessary and unwanted changes to the information.
- ✓ Internet usage is **expensive** in terms of data bundles which are needed to access.
- ✓ **Illiteracy**. Internet usage does not favor **illiterate** people. This limits the illiterate people from accessing information that they would actually need.

**Question Five**

Ben and Shafina have new android phones. Shafina downloaded on her phone the timetable for the new semester. Ben wants to transfer a copy of Shafina's timetable to his phone. Unfortunately they both lack internet data bundles and knowledge of using Bluetooth technology.

a) Identify **two** threats likely to be encountered as a result of using such a technology.

- Transfer of files with viruses.
- Transfer of corrupted data

b) Suggest **two** steps you can take to minimize the effect of such threats.

- Ensuring that the source is not affected by a virus.
- Ensuring that the file is coming from a trusted source.

c) Describe **five** steps they should follow to use the above technology to solve their problem.

- ❖ Both the sender and receiver **switch on** their Bluetooth connections.
- ❖ **Pairing**. This is the process of connecting the sender to the receiver.
- ❖ **Verifying**. The receiver verifies the connection request from the sender.
- ❖ **Sending**. After verification, the sender can then send the files.
- ❖ **Receiving**. The receiver then accepts the sent files and later disconnect the network after receiving all files

**Question Six**

Mrs. Ojambo has received a new laptop as a birthday gift. The laptop does not have any application software installed on it. She has requested you to help her choose the appropriate application for his laptop.

a) Identify **five** factors Mrs. Ojambo needs to consider when buying the software to be installed.

- Cost of software against buyer's budget.
- Usability of the program.
- Requirements of available hardware.

- Type of program needed.
- Needs of the organization.
- Personnel to use the program.
- Functionalities of the program.
- Free from computer bugs.
- Software support and call centers.
- Type and quality of software developer.

b) Explain **five** long term health effects likely to be faced by Mrs. Ojambo as a result of using the gift offered to her.

- ✓ **Repetitive strain injury**. This is an injury or disorder of the muscles, nerves, tendons, ligaments and joints.
- ✓ **Computer vision syndrome**. This includes symptoms of sore, tired burning, itchy or dry eyes.
- ✓ **Backache**. This results from spending much time seated in one position working with the computer.
- ✓ **Eye defects**. This is caused by the continuous looking at the monitor of the computer.
- ✓ **Neck pains.** These are caused by continuous turning of the head while using the computer.

**NOTE**

**1. Precautions**

Take frequent breaks.

Proper keyboard and mouse usage.

Minimize the amount of times you switch between the mouse and the keyboard.

2. ***Computer addiction*** *is when a computer consumes someone's entire social life. This may be because one:*
   - Craves computer time.
   - Overjoyed when at the computer.
   - Unable to stop computer activity.
   - Irritable when not at the computer.
   - Neglects family and friends.
   - Problems at work or school.

**Question Seven**

a) Define the term **Data Processing Cycle.**

**Data Processing Cycle** is the set of operations used to transform data into useful information. The main purpose of this is to create actionable information that can be used to enhance a business. This is because data in raw form is not useful to the organization.

b) Explain **three** methods of data processing.

**Manual data processing.**

This is a method where data processing is handled manually. All the processes are done with human intervention and without the use of any other electronic device or automation software. It is cheap, requires little or no tools but produces high errors, high labor costs and lots of time.

**Mechanical data processing.**
This method involves processing data mechanically through use of machines and devices. These are: calculators, typewriters, etc. It produces less errors

**Electronic data processing**
Here, data is processed with modern technologies using data processing software and programs. A set of instructions is given to the software to process the data and yield output. This method is expensive but provides the fastest processing speeds with the highest reliability and accuracy of output.

c) Describe **five** stages involved in data processing.
**Collection.** The collection of raw data is the first step of the data processing cycle. Here, the raw data is gathered from defined and accurate sources so that the subsequent findings are valid and usable. Raw data may be; monetary figures, website cookies, profit/loss statements of a company, user behavior etc.

**Preparation.** This is the process of sorting and filtering the raw data to remove unnecessary and inaccurate data. Here, raw data is checked for errors, duplication, miscalculations or missing data and transformed into a suitable form for further analysis and processing. This is done to ensure that only the highest quality data is fed into the processing unit.

**Input.** In this step, the raw data is converted into machine readable form and fed into the processing unit. This can be in the form of data entry through the keyboard, scanner or any other input source.

**Data Processing.** Here, raw data is subjected to various data processing methods using machine learning and artificial intelligence algorithms to produce desired output.

**Output.** The data is finally transmitted and displayed to the user in a readable form like graphs, tables, vector files, audio, video, documents etc. This output can be stored and further processed in the next data processing cycle.

**Storage.** This is where data and metadata are stored for further use. This allows for quick access and retrieval of information whenever needed and also allows it to be used as input in the next data processing cycle directly.

## 27 April 2022

### SECTION A

**Question One**

a) Define a **computer virus** as used in ICT.
A **computer virus** is a computer program that can spread across computers and networks by making copies of itself, usually without the user's knowledge.

b) Explain the term **softcopy** as used in Information Technology.
**Softcopy** is an intangible (can't be touched) computer resource. It can be viewed on the screen

c) State **two** measures of taking good care of computers.
- Covering computers when they are not in use
- By shutting computers down while not in use
- Restricting access to unauthorized personnel
- Regular back up of computers
- Installing anti-viruses to protect computers against virus damage
- Putting a specific personnel (computer laboratory attendant) to take care of the computers.
- Employing security guard to guard the computers against thieves.

d) Give **two** characteristics to distinguish the fourth from the fifth generation computers.
Fourth generation computers are slower than fifth generation computers
Fourth generation computers have less storage than fifth generation computers.
Fourth generation computers have less memory than fifth generation computers.

e) State **two** uses of the Bluetooth technology to a student.
Bluetooth technology is used for sharing files
Bluetooth technology is used for sharing internet

f) Distinguish between a **system software** and an **application software**
System software is a software that controls the overall operation of a computer for example operating system while application software is a software designed to perform a particular task. For example Microsoft word

### SECTION B

**Question Two**

a) Identify **five** symptoms of a computer infected with a virus.
- Slow performance
- Slow start up
- Missing files
- No response
- Hardware troubles
- Extra files
- Printer issues

b) List **five** ways through which viruses are spread between computers.
- Sharing of infected files from one device to another.
- Downloading of infected files from the internet.
- Opening infected emails.
- Sharing hardware that is already infected
- Visiting infected sites on the internet.

c) Explain **five** ways of mitigating against computer viruses.
- By installing anti-virus programs on computers.
- By not allowing to receive files from trusted devices.
- By having spam filters on emails received.
- By not visiting and opening suspected sites.
- By not downloading files from suspected sites.

**Question Three**

a) Define the term **operating system**.
The operating system is a computer program that provides an interface between the user and hardware components of a computer and it interacts the user with the computer software.

b) Explain **five** functions of the operating system software in a computer system.
- It provides a user interface. It displays on-screen elements with which you interact
- It loads programs into the computer's memory so that you can use them
- It coordinates how programs work with the computer's hardware and other software
- It manages the way information is stored on and retrieved from disks
- It manages resource sharing

c) Describe **four** factors to consider when purchasing a printer for your printing needs.
- The cost of the printer
- The speed of the printer
- The mechanical condition of the printer
- The durability of the printer
- The reliability of the printer
- The model of the printer

**Question Four**

Some people in education praise internet for causing a positive impact to society.

a) Identify **five** services offered by such technology to business.
- **Communication** – internet allows people from different locations to communicate with each other
- **Digital marketing** – it helps in availing information to the public about the available products in the business for people to view and also make purchase.
- **Advertisement** – internet can be used to advertise various commodities which creates access to different trading points.

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- **E-learning** – internet can also be used to conduct learning services for people in different locations. This can be done using applications like zoom.
- **Entertainment**

b) Explain **five** dangers of "internet" to a business.

- **Virus infections**. One can easily get viruses as a result of using the internet. This may be through downloading infected files or visiting infected sites. Viruses damage computer resources.
- **Immorality** – this is due to the fact that there are sites on the internet with pornographic content (videos and pictures).
- **Cybercrimes** – these are done by the bad guys i.e. hackers. These access information they are not allowed to access and may cause unnecessary and unwanted changes to the information.
- Internet usage is **expensive** in terms of data bundles which are needed to access.
- Internet usage does not favor **illiterate** people. This limits the illiterate people from accessing information that they would actually need.

c) Odong and Mugisha studied and completed their courses online, state **five** benefits that they enjoyed when using such a platform.

- This platform enabled them to study from their places of convenience.
- Studying online gives one time to do other things.
- It saves time because does not need to move to a learning center
- It is also cheap since one does not need to incur transport costs to the learning center
- Since the teaching is recorded, it gives one chance to revisit the taught content and understand better.

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- **Receiving**. The receiver then accepts the sent files and later disconnect the network after receiving all files

b) Identify **three** threats likely to be encountered as a result of using such technology.

- Transfer of files with viruses.
- Transfer of corrupted data
- Slow performance.

c) Suggest **two** steps you can take to minimize the effect of such threats.
- Ensuring that the source is not affected by a virus.
- Ensuring that the file is coming from a trusted source.

**Question Six**

Mrs. Ojambo has received a new laptop as a birthday gift. The gift does not have any application software installed on it. She has requested you to help her acquire the appropriate application.

a) Identify **five** factors that you will consider when buying such software.
- Cost of software against buyer's budget.
- Usability of the program.
- Requirements of available hardware.
- Type of program needed.
- Needs of the organization.
- Personnel to use the program.
- Functionalities of the program.
- Software support and call centers.
- Type and quality of software developer.

b) Explain **five** health long term effects that she is likely to face as a result of using the laptop.
- **Repetitive strain injury**. This is an injury or disorder of the muscles, nerves, tendons, ligaments and joints.
- **Computer vision syndrome**. This includes symptoms of sore, tired burning, itchy or dry eyes.
- **Backache**. This results from spending much time seated in one position working with the computer.
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**Storage.** This is where data and metadata are stored for further use. This allows for quick access and retrieval of information whenever needed and also allows it to be used as input in the next data processing cycle directly.

**06th December 2022**

**SECTION A**

**Question One**

a) Define the term **extranet.**

An extranet is private network that allows access to authorized set of customers, partners, vendors and suppliers. (People outside the company)

**NOTE**

***Intranet*** *is a totally private network where employees (people inside the company) can create content, communicate, collaborate and develop the company culture. It is the most secure network.*

***Internet*** *is a public network that allows people across the world to share and view information that they need. It is the least secure network.*

b) Differentiate between a **ROM** and a **RAM.**

- **ROM** is non-volatile while **RAM** is volatile.
- **ROM** is larger than **RAM** in terms of storage capacity.
- **ROM** is slower than **RAM**

c) Outline **two** methods of processing data.

- Manual data processing
- Mechanical data processing
- Electronic data processing

d) List **two** types of computer generation.

- First generation
- Second generation
- Third generation
- Fourth generation
- Fifth generation

e) Differentiate between a **LAN** and a **WAN.**

**LAN** (Local Area Network) covers a small geographical area i.e. a building or an institution while **WAN** (Wide Area Network) covers a wider area i.e. the whole world.

**Note**

WAN is a group of LANs connected together.

LAN is more secure than WAN

f) Mention **two** ways of classifying computers.

- According to generation
- According to type
- According to size

g) State **two** roles of system programmer in system development.
- ➢ He/she creates new software
- ➢ He/she maintains/programs existing software
- ➢ He/she directs usage of a software

h) List **two** examples of high level programming language.
- ✓ Java
- ✓ JavaScript
- ✓ Python
- ✓ C
- ✓ C++
- ✓ C#

i) State **two** services of utility software.
- ✓ Naming and renaming files
- ✓ Backing up
- ✓ Scanning and eliminating viruses
- ✓ Listing files
- ✓ Deleting files

## SECTION B

**Question Two**

An International guest visited a school in your village and promised to donate computers to the school. The administration does not know what to do with the computers but they have contacted you for guidance.

a) List **two** platforms the administration can use to communicate with other schools.
- ✓ E-mail
- ✓ WhatsApp
- ✓ Facebook

b) Discuss **five** ways in which the computers may be useful to the school.
- ✓ Computers are used to **store information** in the school. This information can be used for future references.
- ✓ Computers are used for **study purposes**. I.e. teaching learners how to use the computers.
- ✓ Computers can be used for **communication** within the school or with other schools and other stakeholders.
- ✓ Computers are used to access study materials from the internet
- ✓ Computers can be used for **admission** of students into the school. This through online platforms like the internet.
- ✓ Through connections to the internet, computers can be used for **advertising** the school for other people to view and know about the school.

c) Explain **four** ways the school can maintain the computers to avoid harm or damage.
- Covering computers when they are not in use. This protects them from dust that may affect its functionality.
- By shutting computers down while not in use. This prevents overheating and damage of the monitors.
- Restricting access to unauthorized personnel. This prevents theft and other people from damaging the computers accidentally or deliberately.
- Regular back up of computers. This prevents loss of data/information in case of virus attacks to the computers.
- Installing anti-viruses to protect computers against virus damage. Viruses affect the smooth running of the computers and may cause loss of data from the computers.
- Putting a specific personnel (computer laboratory attendant) to take care of the computers.
- Employing security guard to guard the computers against thieves.

**Question Three**

A bank in town is faced with challenges of service delivery and they are calling for an upgrade of the application software in use. The management has approached you seeking technical input to upgrading.

a) List **four** examples of application software.
- Microsoft word
- Microsoft excel
- Microsoft PowerPoint
- Microsoft publisher
- Microsoft access
- Web browser

b) Discuss **five** benefits of an upgraded computer system.
- Performance increase. An upgrade system performs smoothly and faster.
- Capacity increase. For example adding a larger hard drive allows the computer to store more information and adding more memory increases the computer's ability to run more programs efficiently.
- Upgrading also makes the computer to meet a program or games system requirements.
- Improved communications. Newer technology enables businesses to communicate with clients and potential customers in numerous ways. I.e. e-mail, social media.
- Better security. This is because ageing systems are not actively security-checked. Newer technology has better security checking in place.
- Compatibility. When something new comes on the market, existing systems and software may not be compatible with it. Upgrading helps them to become compatible.

c) Before the system is used after being developed it must be tested. Explain **three** reasons why that should be done.

- Security. This helps the user to get a trustworthy product, keep the user's personal information and data safe.
- Product quality. This helps to ensure that the system provides the value it promises. This ensures that a quality product is delivered to the market place.
- Customer satisfaction. This ensures that the system provides the best user experience possible.

**Question Four**

A school in the neighborhood intends to purchase computers for the school laboratory from a dealer in town. No one in school knows how to go about it. You have been contacted for guidance before this purchase is approved.

a) Explain **two** ways in which the school users may apply to avoid transfer of harmful viruses to their new computers.
   - By installing updated anti-viruses on their machines. This helps to regularly and automatically scan the computers for any viruses and remove them if any.
   - By making sure that they obtain computer software from authentic sources. This reduces the risk of virus attacks.
   - By ensuring that all files transferred to their computers are from authentic sources.

b) Discuss **three** devices that they would purchase for purpose of data storage.
   - Flash disk
   - Hard disk
   - Compact disk

c) Describe **five** factors you would consider during the selection of new computers.
   - **Storage capacity**. This is the measure of how much information can be stored on a computer.
   - **Amount of RAM.** This is the primary memory of the computer that stores data and information currently being processed.
   - **Processor speed.** This determines the speed of the computer that is being purchased.
   - **Power consumption.** This refers to the amount of power consumed by a computer. Less power consuming computers should be given priority.
   - **Generation.** This refers to the time frame when a particular model of a computer was manufactured. Latest generations should be given priority because they have improved features.
   - **Manufacturer (brand/model).** Computers should be purchased from reliable manufacturers

**Question Five**

The world is becoming a "Global village"; where most businesses are believed to be done electronically, but some people call it madness and believe that it is a sign of the end of the world but it is your duty to change their belief.

a) Explain **five** positive outcomes of computer use in the modern business society.
- ❖ They are used for education purposes
- ❖ They are used in hospitals to archive patient records and treatment received, it allows monitoring of heart rates and blood pressure of a person
- ❖ They are used for surfing the internet.
- ❖ They are used for communication between people in all countries of the world. This is through social media
- ❖ Computers are used to run businesses such as conducting online sales, transferring funds between accounts etc.
- ❖ Computers are also used in transportation in booking travel tickets, determine take-off and direction of aircraft.

b) Discuss **five** challenges that may arise from the widespread handling of businesses electronically.
- ❖ **Cart abandonment.** This is when a buyer visits an e-commerce site, add products to their carts and leave the site without completing the purchase.
- ❖ **Difficulty in finding the right products**. This is because the demand in the market is volatile. So there are always hyped products at different times.
- ❖ **Difficulty in sourcing the selected product**. This is hardship of warehousing the products.
- ❖ **Difficulty in targeting relevant audience**. This has become a limitation due existence of similar products on online platforms where buyers first ask for reviews and compare with other products before making the decision of buying.
- ❖ **Increasing store visits.** This makes the buyer gain confidence in the company he/she is purchasing from. Companies with few visits make buyers suspicious of the legibility of their products.

**Question Six**

MIDY General Hospital uses a manual system to run the hospital programs but face a lot of challenges. You feel they need a computerized system to better their services.

a) Explain **five** areas where such a system may be of importance in the medical world.
- ➢ Such systems help in storing medical and patient data. This data can be used for delivering quality health care.
- ➢ They are also used for telemedicine. Telemedicine is the use of electronic information and communication technologies to deliver health care services from a distance.
- ➢ They are also used for making medical inventories. The systems allows inventory levels to be monitored instantaneously, allowing for more efficient ordering and reordering of supplies.

- These systems also help in disease surveillance and management. This is the tracking of the spread of a disease. This helps health officials to more quickly respond to outbreaks and prevent them from becoming epidemics.
- These systems can be used to make research by the health care professionals. This is because they get access to and analyze vast amounts of data.

b) Discuss **five** possible risks of relying on such a system.
- Dealing with dashboards on connected medical devices and computers removes the human touch of treatment, resulting in a lack of empathy toward patient care.
- The system will sometimes be wrong. This results in patient injury or other health care problems.
- Invasion of medical privacy. This is because information about one's medical history are revealed to others.
- Disruption of work-flow. This results from more time needed to complete tasks. Less time is spent in face-to-face interaction.
- The systems may have poor functionality including poor user interfaces and fragmented displays and delayed care delivery.

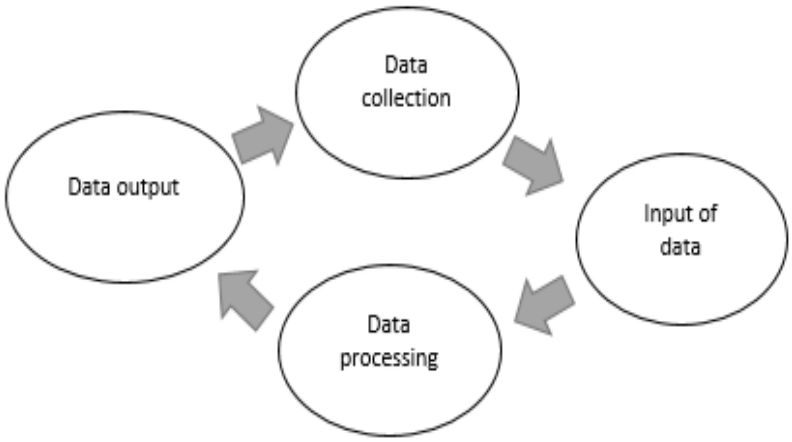
**Question Seven**

A research institute has contracted you to collect data on the impact of computer usage to the youth in your community.

a) Differentiate between **data** and **information** giving examples in each case.
**Data** are raw facts (not yet processed) that are entered into the computer while **information** is processed data
**Other differences**
**Data** can't be used to make decisions while **information** can be used to make decisions.
**Data** does not have meaning while **information** has meaning

b) Explain **three** tools you can use to accomplish the above research.
Questionnaire – this is a set of questions set by the researcher to be answered by the respondents.
Paper – this can be used to note down the findings
Pen – this is also used to note down the findings
Recorder – this can be used to record interview sessions with the respondents.

c) Use a simple illustration to explain **four** levels of the data processing cycle in relation to your research.

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**Input.** In this step, the raw data is converted into machine readable form and fed into the processing unit.

**Data Processing.** Here, raw data is subjected to various data processing methods using machine learning and artificial intelligence algorithms to produce desired output.

**Output.** The data is finally transmitted and displayed to the user in a readable form like graphs, tables, vector files, audio, video, documents etc. This output can be stored and further processed in the next data processing cycle.

**Storage.** This is where data and metadata are stored for further use. This allows for quick access and retrieval of information whenever needed and also allows it to be used as input in the next data processing cycle directly.

## 7th August 2023

### Question One

(a) Differentiate between the following terms.

(i) Software and Hardware.

Software is a set of instructions that control computer hardware operations while computer hardware are the tangible/ physical components of a computer system.

(ii) Systems Software and Application Software.

Systems software is a software that controls the overall operation of a computer system while Application software is a software that is used to accomplish a specific task.

(iii) Program and code

A program is a set of instructions written in a programming language to perform a specific task or set of tasks while Code refers to the written instructions in a programming language that a computer can understand and execute.

(b) Discuss four differences between customized Software and Standardized Software.

- Customized software is developed specifically for a particular organization or business to meet its unique requirements while Standardized software, also known as off-the-shelf or pre-packaged software, is developed for a broader audience and is available for purchase without significant modification.
- Customized solutions can be highly flexible and adaptable to the unique needs of an organization while Standardized software may have limitations in terms of customization, as it is designed to cater to a broader user base.
- Customized software has high initial cost while standardized software has a lower initial cost.
- Customized software requires ongoing maintenance and support, particularly when there are changes in business processes, technologies, or security requirements while standardized software often comes with regular updates and support provided by the software vendor.

### Question Two

(a) The principal of Bright High School would like to establisher laboratory for his school and has contacted you for help. As an ICT student, explain three safety precautions for protecting the following in the computer laboratory;

(i) Computers.

- Not carrying foodstuffs to the computer laboratory.
- By installing antiviruses to protect the computers from being attacked by viruses.
- By making regular updates in the computer software to enhance their functionality.
- By shutting down and switching off computers after use.

(ii) Users or students.

- Ensure that students have individual user accounts, and encourage them to log out when they finish using a computer to prevent unauthorized access.
- Emphasize the importance of regular data backups to prevent loss of important files in case of hardware failure or other issues.
- Implement internet filters to restrict access to inappropriate websites and to protect students from potential online threats.
- Provide secure storage for students' personal belongings to prevent theft.
- Promote health and hygiene practices, such as regular handwashing, especially in shared computer environments, to reduce the risk of spreading illnesses.
- Implement policies and measures to prevent cyberbullying within the computer lab. Encourage an environment of respect and tolerance.

(b) Discuss four general rules and regulations for governing the computer laboratory.

- Promote user accountability for actions taken within the computer laboratory, encouraging responsible and respectful behavior.
- Establish guidelines for the proper handling and care of computer equipment to ensure longevity and prevent accidental damage.
- Implement security measures to protect both the physical environment and the data stored on computers within the laboratory.
- Establish rules regarding who has access to the computer laboratory and under what conditions.
- Implement measures to supervise and monitor activities in the lab.
- Define an Acceptable Use Policy (AUP) that outlines the acceptable and unacceptable behaviors when using computers and technology in the lab.

**Question Three**

An Old man bought a computer which runs windows XP versions. The son accidently tempered with the windows files and the computer stopped booting. He contacted you for help on the steps of installing newer version of windows.

(a) Explain six major steps involved in installing a windows operating system.

- **Check system requirements.** Ensure that the computer meets the minimum hardware requirements for the Windows version you intend to install. This includes processor speed, RAM, and disk space.
- Insert the Windows installation disc or connect the USB drive to the computer. Restart the computer and access the BIOS or UEFI settings to set the boot order, ensuring that the system boots from the installation media.
- Start the windows installation. The computer will boot into the Windows Setup screen. Follow the on-screen instructions to begin the installation process.
- Enter the product key when prompted. This is a unique code provided with your Windows license.
- Create a user account and set a password. This account will be used to log in to Windows.
- Download and install the latest Windows updates to ensure the operating system is up to date.

(b) Discuss four benefits he would get from upgrading from windows XP to windows 10 operating system.

- Windows 10 includes robust security features, regular security updates, and built-in antivirus protection (Windows Defender). However, Windows XP is an outdated operating system that no longer receives security updates from Microsoft. This makes it highly vulnerable to modern security threats such as malware, viruses, and other exploits.
- Windows 10 offers broad compatibility with the latest software applications and hardware peripherals. However, As an aging operating system, Windows XP faces compatibility issues with many modern software applications and hardware devices.
- Windows 10 is designed with performance enhancements that take advantage of modern hardware capabilities. However, Windows XP lacks the optimizations and performance improvements found in more recent Windows versions.
- Windows 10 has more enhanced user interface and productivity features than windows XP.
- Windows 10 has Microsoft store than provides access to a number of modern applications which are not compatible with windows XP.

**Question Four**

One of the threats to the computing world is computer virus which destroys and disorganizes the normal functioning of the computer.

(a) As a student of ICT, advice on five ways in which computer virus can be prevented from attacking computers.

- By installing anti-virus programs on computers.
- By not allowing to receive files from trusted devices.
- By having spam filters on emails received.
- By not visiting and opening suspected sites.
- By not downloading files from suspected sites.

(b) Apart from computer virus, list four other threats to the computing world.

- **Malware (malicious software).** This is a broad category of harmful software designed to disrupt, damage, or gain unauthorized access to computer systems. This includes various types of malicious programs such as Trojans, spyware.
- **Phishing attacks.** Phishing is a type of social engineering attack where attackers trick individuals into providing sensitive information, such as login credentials or financial details.
- **Denial of service attacks.**
- Data breaches. Data breaches involve unauthorized access to sensitive information, resulting in the exposure or theft of confidential data.
- Insider threats.

(c) Explain three ways through which the above threats in 4(b) can be prevented.

- Use reputable antivirus software and keep it updated.
- Regularly update operating systems and software to patch vulnerabilities.
- Exercise caution when downloading files or clicking on links, especially from unknown sources.
- Educate users about recognizing phishing attempts.

- Implement email filtering systems to detect and block phishing emails.
- Verify the authenticity of websites and use secure connections (HTTPS).
- Encrypt sensitive data, both in transit and at rest.
- Implement access controls and regularly review user permissions.
- Conduct regular security audits and vulnerability assessments.
- Implement the principle of least privilege for user access.

**Question Five**

Computers have evolved from various generations each with unique notification functionality.

(a) Explain four of these generations of computers.

✓ **First generation computers.** These were the very first computers to evolve. They were huge, slow and had low storage capacity.

✓ **Second generation computers.** These came after the first generation. They were big though slightly faster than first generation computers. They were costly.

✓ **Third generation computers.** These improved in size, speed and in terms of storage capacity. They had more memory than first and second generation computers.

✓ **Fourth generation computers.** These are greatly improved generation of computers. They have a high storage capacity compared to earlier generations. They are faster and have larger memory than the earlier generations of computers.

(b) Discuss three advantages of newer generations over older generations of computers.

- Newer generations of computers have larger storage capacity than the older generations of computers
- Newer generations of computers have bigger memory space than older generations of computers.
- Newer generations of computers are smaller in size than the older generations of computers.
- Newer generations of computers are faster in processing as compared to the older generations of computers.

(c) Describe three negative effects of computers on society.

- It facilitates computer crime and cyber theft.
- It may increase unemployment. A task that can be done by several people is accomplished by one computer
- There are chances of stealing data which destroys data. This may be through hacking

**Question Six**

One of the requirements of being admitted to a Talik university is to report with a computer on the first day. While preparing to report back, a student wanted to buy a new computer and asked you for help.

(a) Distinguish between the following computer terminologies;

(i) RAM and ROM

RAM is volatile while ROM is non-volatile

RAM is faster while ROM is slower.

RAM is stores data temporarily while ROM stores data permanently.

(ii) Bits and Bytes.

Bits are the smallest representation of a data item (0s and 1s) while a byte is a group of eight bits.

(iii) Command line and Graphical User Interface.

- In command line interface, you type commands to execute tasks while graphical user interface is made up of onscreen resources/ icons which can be selected by clicking.
- Command line interface is more secure than graphical user interface.
- Graphical user interface is more user friendly than command line interface.
- Graphical user interface takes up more disk space while command line interface takes up less disk space.

(b) Explain four factors he should consider while buying a new computer.

- **Processor**. Choose a processor that suits your needs.
- **Random Access Memory**. Ensure the computer has sufficient RAM for your tasks.
- **Cost**. Establish a realistic budget. Computers come in a wide price range, and knowing your budget helps narrow down the options.
- **Computer Model.** Decide the model of the computer of your choice.
- **Storage Type and Capacity.** Decide between HDD (Hard Disk Drive) and SSD (Solid State Drive) storage. SSDs are faster and more reliable but may be more expensive.

**Question Seven**

A farmer from kakoro village bought a Central Processing Unit case from someone who convinced him that it's a full computer system, on reaching home it never worked as he expected. He came to you for help, as a student of ICT;

(a) Explain four components that make up a computer system.

- **Main memory (RAM).** The Main memory stores data and instructions that are currently being used by the processor.
- **Central Processing Unit (CPU).** The Central Processing Unit controls the overall operation of the computer system. It executes commands.
- **Input/ Output devices.** The I/O devices are used for entering and retrieving data from the computer system.
- **System Interconnection.** This is a mechanism to provide communication between computer components.

(b) Give three input and output devices of the computer systems.

| Input devices | Output devices |
|---|---|
| Keyboard | Monitor |
| Mouse | Printer |
| Camera | Projector |
| Scanner | |
| Joystick | |
| Light pen | |

(c) Discuss three importance of computers.

- They are used for education purposes
- They are used in hospitals to archive patient records and treatment received, it allows monitoring of heart rates and blood pressure of a person
- They are used for surfing the internet.
- They are used for communication between people in all countries of the world. This is through social media
- Computers are used to run businesses such as conducting online sales, transferring funds between accounts etc.
- Computers are also used in transportation in booking travel tickets, determine take-off and direction of aircraft.
- Computers are used for entertainment.

**Question Seven**

Jalia would like to start up an internet café in her home town of about eight computers but does not know what she should have in place to start the business and has contacted you for help. As an ICT technician;

(a) Outline four open source software he can install in her computers.

- Mozilla Firefox
- Ubuntu
- LibreOffice
- MikroTik RouterOS
- OpenOffice

(b) Analyze three ways through which she can connect the computers to internet.

- Wired Ethernet connection. Jalia can use Ethernet cables to connect each computer to a network switch or router, which is then connected to the internet modem provided by the Internet Service Provider (ISP).
- Wireless WI-FI connection. A wireless router connected to the internet modem can provide Wi-Fi access to customers and staff within the café premises.
- Mobile hotspot. Jalia can use mobile hotspot devices or smartphones with tethering capabilities to provide internet connectivity.

(c) Explain five components she should purchase to set up her business.

- **Computers.** Purchase desktop computers or laptops depending on the space available and the café's design.
- **Networking equipment.** She should buy networking equipment like routers and switches.
- Choose an internet service provider (ISP) and subscribe to a suitable internet plan based on the expected usage and number of customers. Consider factors such as speed, data limits, and reliability.
- **Furniture.** Purchase desks, chairs, and tables to accommodate the computers and provide a comfortable working environment for customers.
- **Power protection.** Install uninterruptible power supply (UPS) units to protect computers and networking equipment from power outages and voltage fluctuations.

- **Software licenses.** Ensure legal compliance by obtaining any necessary software licenses for proprietary software used in the café.
- **Printers and scanners.** If providing printing and scanning services, purchase printers and scanners.
- **Cabling and cable management.** Purchase Ethernet cables for wired connections, ensuring they are of sufficient length. Implement cable management solutions to keep the workspace organized and prevent tripping hazards.

## 11th August 2023
## SECTION A

**Question One**

(a) Define data processing as used in ICT.

**Data Processing Cycle** is the set of operations used to transform data into useful information. The main purpose of this is to create actionable information that can be used to enhance a business.

(b) Explain the procedure of data Processing.

Data is collected from intended sources. It is then fed into the computer for processing. The results of processing are output and stored for future use and reference.

(c) State two devices used for data entry.

- Keyboard
- Mouse
- Joystick
- Camera
- Scanner

(d) Distinguish between a monitor and a printer.

- A monitor displays results of processing while a printer is used to provide hard copies of the processed data.

(e) Outline two advantages of a computer network system.

- Networking enables resource sharing among the connected devices.
- Networking enables collaboration and communication among connected devices.
- Networking facilitates centralized data management.

(f) Describe two causes of computer viruses.

- Sharing files from an infected source (computer or phone).
- Opening spam messages/ mails from unknown senders.
- Downloading files from corrupted sites.

(g) Outline the steps followed to perform cold booting and warm booting.

- For cold booting
    - Power off the computer
    - Press the power button to turn it on
    - Then the BIOS initializes the hardware, the bootloader loads and hands over to the operating system
    - The operating system loads into memory and the user logs in.
- For warm booting
    - Initiate restart from the operating system, OS shutdown begins.
    - The BIOS settings are preserved, the bootloader may be skipped.
    - The OS reloads into memory and the user logs in.

## SECTION B

**Question Two**

As an Information Officer, you are required to know the different types of information as applicable in the field of ICT.

(a) Describe three types of information.

**Personal information.** Information related to an individual, such as name, address, phone number, email, date of birth, and social security number.

**Business information.** Information related to business operations, including financial data, sales figures, customer information, and business strategies.

**Financial information.** Data related to financial transactions, accounts, budgets, and investments.

**Health information.** Data about an individual's health, medical history, prescriptions, and treatment plans.

**Educational information.** Information related to academic pursuits, including grades, transcripts, educational history, and curriculum materials.

**Legal information.** Information pertaining to laws, regulations, contracts, and legal cases.

**Technical information.** Information related to technology, including technical specifications, manuals, blueprints, and engineering designs.

**Scientific information.** Data generated through scientific research, experiments, and observations.

**Cultural information. I**nformation about a particular culture, including traditions, customs, languages, and artistic expressions.

**Environmental information.** Data related to the environment, including climate data, ecological studies, and environmental impact assessments.

**Entertainment information.** Information related to entertainment industries, including movies, music, literature, and gaming.

(b) Explain seven qualities of good information.

**Accuracy.** Information is accurate when it is free from errors and represents the reality or truth of a situation.

**Relevance.** Relevant information is directly related to the subject at hand and contributes to the understanding or resolution of a specific issue.

**Completeness.** Complete information includes all the necessary details and data required for a particular purpose or analysis.

**Timeliness.** Timely information is available when it is needed and is up-to-date, reflecting the current state of affairs.

**Consistence.** Consistent information does not contradict itself and is in harmony with other available data.

**Clarity.** Clear information is presented in a manner that is easily understandable, without ambiguity or unnecessary complexity.

**Precision.** Precise information is specific and provides detailed, accurate data without unnecessary elaboration.

**Security.** Secure information is protected from unauthorized access or manipulation, ensuring its integrity and confidentiality.

**Question Three**

(a) State four classifications of computers.
- Classification according to generation
- Classification according to type
- Classification according to size
- Classification according to function

(b) Outline four computer features of first and second generation of computers.
- They were huge/ big.
- They were very slow
- They were very costly.
- They were difficult to manufacture.
- It was difficult to remove errors.

(c) Describe the classifications in 3(a) giving examples in each case.
- According to generation is when computers are classified according to the time period they were manufactured. For example first generation.
- According to type is when computers are classified according to their categories. For example digital computers.
- According to size is the classification of computers according to physical size. For example mainframe computers which are bigger than desktop computers.
- According to function is when computers are classified according to what they are meant to do. For example super computers which are meant to handle complex calculations at a high speed.

(d) Explain two characteristics of fifth ($5^{th}$) generation computers.
- They have a high memory capacity. The memory size goes up to 100 Terra Bytes (1 Terra Byte = 1024 Giga Byte).
- Fifth generation computers are able to understand natural languages & able to convert one language from another language.
- Fifth generation computers are very intelligent because they have self-learning techniques.
- Fifth generation computers are very fast in processing.
- Fifth generation computers have a very high storage capacity of data.

**Question Four**

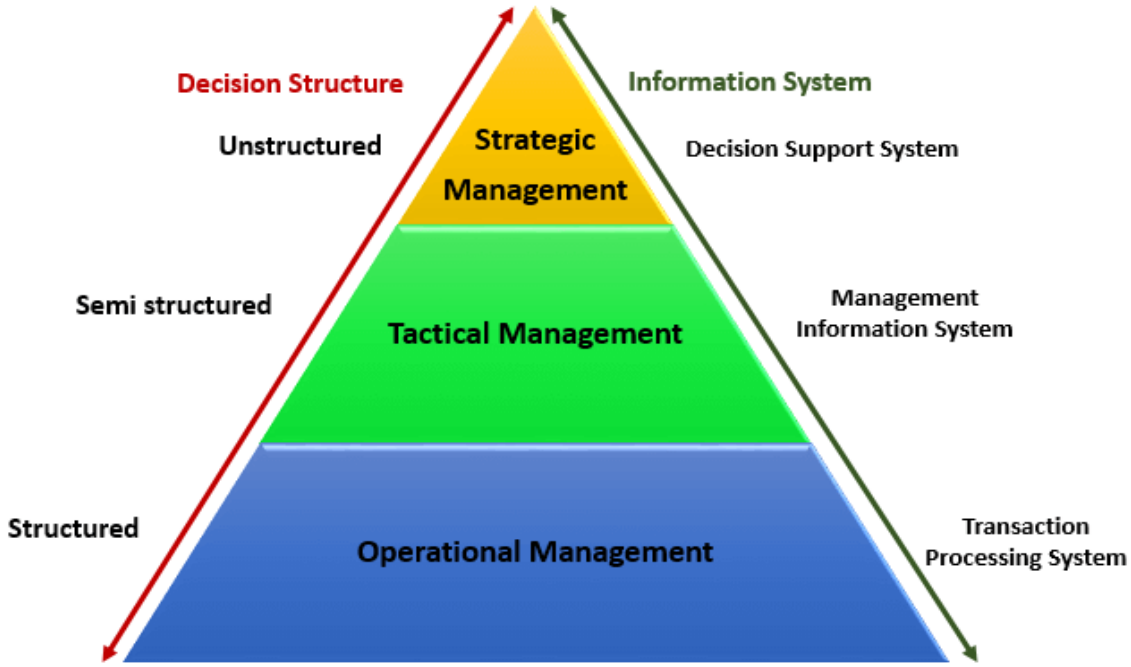
BTK uses an information management system (IMS) to handle the information needs of refugees from various campus.

(a) Define the term Information Management system.
An information management system is an arrangement of people, data, processes, and information technology that interact to collect, process, store, output and provide information needed to support an organization.

(b) Explain five different types of IMS that BTK can use.

- **Transaction Information System.** This is designed to handle routine and repetitive transactions. It processes day-to-day transactions that occur in an organization, such as sales, purchases, and inventory updates
- **Management Information System.** This focuses on providing middle and top-level management with summarized, structured information. It assists in monitoring and controlling the business operations
- **Decision Support System.** This is designed to support decision-makers in semi-structured and unstructured decision-making. It provides tools for analyzing data and making decisions
- **Executive Support System.** This is designed to provide top-level executives with strategic information for long-term planning
- **Enterprise Resource Planning System.** This system integrates various business processes and functions across an organization into a unified system. It facilitates real-time information flow and collaboration

(c) Using sketch diagram, describe the levels of an information Management system.




**Question Five**

(a) Distinguish between debuggers and editors as used in computer programming.
A debugger is a tool used for identifying and fixing errors (bugs) in a program while a text editor is a tool used for creating, modifying, and managing source code.

(b) Hassan was tasked to design an in-house program for DAK Company Ltd using either machine code or high level language.
(i) State two examples of each language Hassan is to use.

- **High level languages –** Python, Java, JavaScript, C#, C, C++.
- **Machine code –** 0, 1.

(iii) List two characteristics of each language.

**High level languages**

- High-level languages provide a level of abstraction from the underlying hardware, allowing programmers to focus on the logic of their programs rather than intricate machine details.
- High-level languages emphasize human readability, making the code more understandable and accessible.
- High-level languages are designed to be easy to write and maintain.
- Code written in a high-level language is generally portable across different platforms and architectures.
- High-level languages promote code maintainability by employing clear and standardized syntax.

**Machine code language**

- Machine code is represented in binary, consisting of 0s and 1s.
- Machine code instructions are specific to the architecture of the CPU.
- Machine code instructions directly represent low-level operations performed by the CPU, such as arithmetic and logic operations, data movement, and control flow instructions.
- Machine code instructions interact directly with the hardware components of the computer, including registers, memory, and the arithmetic logic unit (ALU) of the CPU.

(iv) Explain four advantages of programming using high-level over machine code language.

- High level languages are portable while machine codes are not portable at all.
- High level languages have a higher level of abstraction than machine code language.
- Programs written in high level languages are easy to maintain compared to those in machine code language.
- Programs written in high level languages are easy to read while those in machine code language are difficult to read.
- Programs written using high level languages are easier to debug than programs written in machine code language.

**Question Six**

(a) Outline five basic features on an email.

- Sender
- Receiver
- Header
- Subject
- Body
- Carbon copy (cc)

(b) Explain four benefits of email communication.

- It is a cheap way of communicating.
- It is easy to use email communications.
- Email communications are flexible.
- Earlier communications can be retrieved for reference.

(c) Describe the steps followed to send on email when using a computer connected to the internet.

- Open the email application software to be used, sign in to your user account.
- Select "compose new email".
- On the new prompt, put the email of the receiver, write the subject of the email.
- Compose the body of the email.
- Include carbon copies (cc) if any.
- Provide any attachments if needed and then send the email.

**Question Seven**

(a) Differentiate between an intranet and extranet networks.

- An intranet serves as a private network for internal communication and collaboration, while an extranet extends connectivity beyond the organization, allowing shared resources and collaboration with external entities.
- An intranet is dedicated to internal processes and information sharing within an organization, while an extranet expands these capabilities to include selected external entities.
- An intranet provides a secure platform for internal data and resource sharing, while an extranet extends this capability to foster controlled collaboration with external associates.

(b) Copper technologies is in a process of establishing an intranet and extranet to boost their services. Explain five areas of application for such networks.

- Document and Knowledge Management (intranet). An intranet can serve as a repository for important documents, manuals, and knowledge resources.
- Client collaboration and information sharing (extranet). An extranet allows Copper Technologies to collaborate with clients, providing them access to specific resources and information.
- Internal communication and collaboration. An intranet provides a dedicated platform for employees within Copper Technologies to communicate, collaborate on projects, and share information.
- Vendor and partner collaboration. Copper Technologies can use the extranet to collaborate with vendors and partners, facilitating seamless communication and resource sharing.
- Remote access and remote connectivity. Both intranet and extranet enable remote access to important resources, allowing employees and external collaborators to connect from anywhere.

(c) Describe three cybercrimes committed over computer networks.

**Phishing attacks.** Phishing is a type of cybercrime where attackers use deceptive emails, messages, or websites to trick individuals into revealing sensitive information such as usernames, passwords, or financial details.

**Ransomware attacks.** Ransomware is malicious software that encrypts a user's files or entire systems, rendering them inaccessible.

**Distributed denial of service attacks.** DDoS attacks involve overwhelming a target's online services, such as websites or servers, with a flood of traffic from multiple sources.

**Malware attacks.** Malware, short for malicious software, encompasses a range of harmful software types, including viruses, worms, Trojan horses, and spyware.
**Insider attacks.** Insider threats involve individuals within an organization who misuse their access to systems and data for malicious purposes.