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GUIDE TO THE TOPICAL QUESTIONS FOR BOTH SUB-ICT AND COMPUTER STUDIES PAPER 1

INTRODUCTION TO COMPUTING

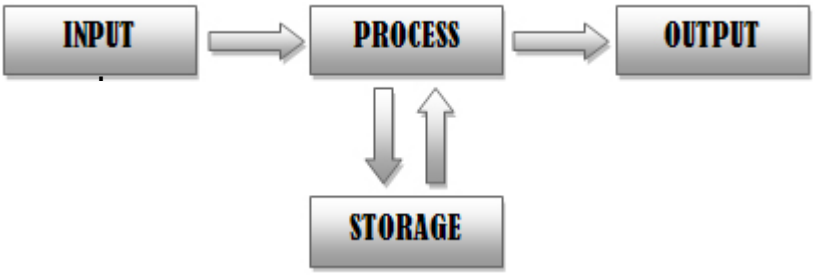
1) a) Define the following terms in relation to computing.
   i) Computer: **is an electronic machine that can accept data input, process it according to some specified instructions, output the information, and store the results for future use.**
   ii) Information & Communications Technology (ICT): **is the combination of telephone lines, computers and software, which enable users to create access, store, manipulate and transmit data/information.**
   iii) Information Technology: **is the combination of computer and communication technologies to process data into information.**

   b) State **three** reasons for studying computer/ICT.
   - ✓ **To acquire general knowledge and skills in the use of a computer and related technologies.**
   - ✓ **To acquire knowledge as a foundation for further studies in computer technology.**
   - ✓ **To use the knowledge obtained in computer studies to enhance learning in other subjects.**
   - ✓ **To understand the important issues of technology based society and show ethical behavior in use of computers and other technologies**

   c) Explain the following computer characteristics.
   i) Automation: **means computers do not need any supervision in order to perform programmed routines.**
   ii) Versatility: **means computers can execute many tasks at the same time, provided they are given the appropriate logical steps.**
   iii) Diligence: **means computers are machines that do not get tired bored or lose concentration like human beings.**
   iv) Artificial intelligence: **means computers can respond to requests given to them and provide solutions.**

2) a) Define the following terminologies in relation to computing giving **two** examples where necessary.
   i) Data: **is defined as raw facts and figures that have less meaning to the end user. E.g. a letter (a, b, c), students' marks, Musical notes. Employee salary.**
   ii) Information: **is a processed data which is meaning full to the end user. E.g. a word (love, honey), students' report, a Song, Employee pay roll.**
   iii) Data processing: **means transforming the raw facts (data) into information.**
   iv) Information processing cycle**: is the sequence of transforming the raw facts (data) into information which involves input, processing, output, and storage activities.**

   b) Using a diagram, illustrate the Information Processing Cycle giving **one** device applied at each stage.



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INPUT

Keyboard, mouse, microphone, digital camera etc.

PROCESS

Processor

OUTPUT

Monitor, projector, printer, plotter etc.

STORAGE

Hard Disc, Compact Disc, flash memory, magnetic tape, RAM, ROM

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c) Define the following information processing processes.

i) Batch processing system: **here data is collected together in a batch before processing starts. E.g. payroll systems, Report card making systems etc.**

ii) Real time processing system: **here data is processed without significant delay. E.g. anti-missile defense systems, airplane landing control system etc.**

iii) Interactive processing system: **this involves communications between the user and the computer during processing. E.g. Electronic Fund Transfer Systems, Point of Sales Systems.**

3) a) Write short notes on the following devices and personalities in relation to history and evolution of computers.

(**For O'level Only**)

i) Abacus: **This is the first manual calculating device used to perform basic arithmetic operations.**

ii) John Napier: **He invented Napier's bones that was used to multiply, divide and calculate square and cube roots.**

iii) William Oughtred: **He invented the Slide rule basing on Napier's logarithms. It is used primarily for multiplication, division, roots, logarithms, Trigonometry.**

iv) Blaise Pascal: **He invented Pascal's Calculator and its limitations were addition and subtraction.**

v) Gottfried Wilhelm Leibniz: **He invented Stepped Reckoner/ Leibniz Calculator. He just improved Pascal's Machine. Leibniz calculator could do addition and subtraction which was a limitation to Pascal's calculator.**

vi) Joseph-Marie Jacquard: **He invented the Jacquard weaving Loom machine that was used to control the weaving process when making complex patterns.**

vii) Thomas de Colmar: **He discovered the Arithmometer and this was first mechanical calculator.**

viii) Charles Babbage: **He invented the Difference Engine and Analytical Engine. He is considered as the father of computers.**

ix) Lady Ada Lovelace: **She developed the Binary Number System for Babbage's machine. She is considered as the First Computer Programmer.**

x) Per Georg Scheutz: **He invented Scheutzian Calculation Engine basing on Charles Babbage's difference engine. It was the first printing calculator.**

xi) Herman Hollerith: **He invented the Tabulating Machine that was used by the USA government in 1890 population census.**

xii) Howard H. Aiken: **He invented Havard Mark 1. It was the first electromechanical computer.**

xiii) Konrad Zuse: **He invented Z1. This was the first programmable computer.**

xiv) Professor John Atanasoff: **He invented Atanasoff-Berry Computer (ABC). It was the first electronic digital computing device.**

b) List **two** examples of;

i) Simple calculating devices: **Abacus, Slide rule, Napier's bones.**

ii) Mechanical era computers: **Pascal's Calculator, Leibniz Calculator, Jacquard weaving Loom machine, Difference Engine, Tabulating Machine etc.**

iii) Electronic era computers: **ENIAC (**Electronic Numerical Integrator and Computer**), UNIVAC 1 (**Universal Automatic Computer 1**), EDSAC (**Electronic Delay Storage Automatic Computer**), EDVAC (**Electronic Discrete Variable Automatic Computer)

c) Outline **three** characteristics of computers in the mechanical era.

- ✓ **They had mechanical gears.**
- ✓ **They had wheels and moving parts**
- ✓ **They used punched cards and tapes to store data.**

4) a) Define the term **Computer Generation**. **(For O'level Only)**

- ✓ **Computer generation refers to the state of improvement in computer technology year after year.**

b) List the major technological developments in of the following computer generations.

i) First computer generation: **Vacuum Tubes**
ii) Second computer generation: **Transistor**
iii) Third computer generation: **Integrated Circuits**
iv) Fourth computer generation: **Micro-processors (LSI and VLSI)**
v) Fifth computer generation: **Ultra Large Scale Integration (ULSI)**

5) a) State **four** major applications of computers/ICT in each of the following fields.

i) Education/Schools
- ✓ **Computer Based Training (CBT)**
- ✓ **Computer Aided Learning (CAL)**
- ✓ **Training through simulations techniques**
- ✓ **Research**
- ✓ **Online library/e-books**

ii) Health/Hospitals
- ✓ **Lab-diagnostic System**
- ✓ **Patient Monitoring System**
- ✓ **Pharmacy Information System**
- ✓ **Clinical image processing**

iii) Finance/Banks
- ✓ **Internet banking/online banking/e-banking**
- ✓ **Automated Teller Machines (ATM)**
- ✓ **Information systems audit**
- ✓ **Mobile Banking**

iv) Defence/Security/Police/Military
- ✓ **Military aptitude**
- ✓ **Military secrecy**
- ✓ **Guidance system**
- ✓ **Research and detective work Computer aided flight**

v) Communication
- ✓ **Internet telephony (VoIP)**
- ✓ **Video Conferencing**
- ✓ **E-mail**
- ✓ **Chatting**
- ✓ **Computer assisted speech**

vi) Entertainment
- ✓ **Music**
- ✓ **Television and movies**

- ✓ **Games**
- ✓ **Sports**

vii) Homes

- ✓ **Home budgets**
- ✓ **Online shopping**
- ✓ **Online banking**
- ✓ **Chatting/instant messaging**
- ✓ **Entertainment**

viii) Politics and governance

- ✓ **Keeping and managing records**
- ✓ **Paying Tax**
- ✓ **Online form registration**
- ✓ **Advertisement**
- ✓ **E-voting**

b) State **three** instances in which Information Technology has rendered people jobless in today's society.

- ✓ **In Education through online lessons and Computer Based Training.**
- ✓ **In Banks through ATM's**
- ✓ **In marketing through online adverts and social media.**
- ✓ **In industries through Robotic technology.**

6) a) Define the term '**Green Computing**'. **(For A' Level Only)**

- ✓ **Green Computing is the practice of using computers in an environmentally friendly manner.**

b) State **two** goals of Green Computing.

- ✓ **To reduce the use of hazardous materials.**
- ✓ **To maximize energy efficiency during the product's life time.**
- ✓ **To promote recyclability of defunct products and factory waste.**

c) Outline **four** green computing practices.

- ✓ **Use computers and devices that comply with the ENERGY STAR program.**
- ✓ **Turn off the monitor, printer and other devices when not in use.**
- ✓ **Use paperless methods to communicate.**
- ✓ **Recycle paper.**
- ✓ **Recycle old computers and printers.**
- ✓ **Telecommute (saves gas).**

d) State **two** limitations of green computing practices.

- ✓ **High startup cost.**
- ✓ **Not readily available.**
- ✓ **Still under experimental stages.**

e) Explain the following in relation to Green Computing.

i) Material recycling: **is the process of converting waste materials into new useful products.**

ii) Telecommuting: **is a state in which the employee works off-site or at home via internet and phone connection.**

7) With examples, state the major categories of computers in each of the following computer classifications.

(For O'level Only)

i) Classification by process
- ✓ **Analog computer:** is a computer that uses continuous physical phenomena such as electrical, mechanical or hydraulic quantities to model the problem being solved. E.g. speedometer, pressure gauge, tire pressure gauge etc.
- ✓ **Digital computer:** is a computer that performs calculations and logical operations with quantities represented as digits, usually in binary number system (0s and 1s). E.g. calculators, digital thermometers, digital watches etc.
- ✓ **Hybrid computer:** is a computer that processes both analog and digital data. E.g. Computers used in hospitals to measure the heartbeat of patients, Devices used in petrol pump, Hybrid Machines used in controlling industrial processes.

ii) Classification by size
- ✓ **Super Computer:** is the fastest, most powerful and most expensive computer which is used for complex tasks that require a lot of computational power. E.g. IBM Deep Blue, NEC – 500 etc.
- ✓ **Mainframe Computer:** is a very large and expensive computer capable of supporting thousands of users at same time. E.g. IBM4381, IBM370 etc.
- ✓ **Mini Computer:** is physically smaller than a super and main frame computer. It can support 50 to 500 users, and is slower than super and mainframe computers. E.g. DECS VAX range and IBM AS400 range
- ✓ **Micro Computer:** is a single user general purpose computer that can perform all inputs, process, output, and storage activities by itself. E.g. Desktop computer, Tower model computer, Laptop computer and palmtop (handheld) computer.

iii) Classification by purpose
- ✓ **Special purpose computer:** designed to handle one task.
- ✓ **General purpose computer:** designed to handle a variety (many) tasks.

iv) Classification by processor power
- ✓ Computers are classified according to their processing speed i.e. how fast they can execute given tasks. E.g. 80286, dual core, Pentium III, and Pentium IV, i5 core 5, I core 7 etc.

LABORATORY CARE, TROUBLESHOOTING AND MAINTENANCE

1) a) Define the following terms.

i) Computer Laboratory: **is a room that is specially designed and prepared to facilitate the installation of computers and to provide a safe and conducive environment for using the computers.**

ii) Computer Literacy: **refers to having the knowledge and understanding of computers and their uses.**

iii) Computer Skills: **refers to the ability to use the software and hardware of a computer.**

iv) Digital Divide: **refers to the gap between those who know how to use computers and those that don't.**

b) List **four** measures taken to ensure that computers in a laboratory are safe.
- ✓ **The computers should be properly switched on or off.**
- ✓ **Install and update antivirus.**
- ✓ **Lock the laboratory after use of computers.**
- ✓ **Use burglar proofing.**
- ✓ **Setup lightening arrestors to guard against thunder.**
- ✓ **Keep fire extinguishers to guard against fires.**

- ✓ **The computers should be connected to the UPS or stabilizer to avoid short circuits and loss of data.**
- ✓ **Keep the computers in a dust free environment.**
- ✓ **Foods and drinks should not be allowed in the computer laboratory.**
- ✓ **Computers should be allowed to cool down before covering them.**
- ✓ **Use firm tables to hold the weight of hardware.**
- ✓ **Avoid illegal connections and disconnections.**
- ✓ **Avoid exposing computers to heat/direct sunlight**

c) Outline **three** computer security risks in the computer lab.

- ✓ **Absence of Fire extinguisher poses a fire risk.**
- ✓ **Absence of a lightening arrestor on poses a risk or lightening.**
- ✓ **Absence of burglar proofs and strong locks poses a risk of hardware theft.**
- ✓ **Absence of strong passwords and firewalls poses a risk of data theft.**
- ✓ **Absence of updated antivirus software poses a risk of data loss.**

d) Mention **three** ways you can enforce computer laboratory security.

- ✓ **Configure settings with strong firewall and access passwords.**
- ✓ **Establish burglar proofs and strong locks to keep the computers secure from thieves.**
- ✓ **Update the antivirus program regularly to protect the computers against virus attacks to prevent data loss.**
- ✓ **Install lightening arrestors to the computer lab to safeguard against lightening.**
- ✓ **Install fire extinguishers to help fight against fie outbreaks.**

e) Develop a check list of **four** practical computer laboratory rules and regulations for your school.

- ✓ **No eating from the computer lab.**
- ✓ **No fighting in the computer lab.**
- ✓ **Computers must be safely shut down and covered after use.**
- ✓ **No deletion of files one did not create.**
- ✓ **No personal passwords are allowed.**
- ✓ **Movement of devices is prohibited.**
- ✓ **Users must report faults as identified.**
- ✓ **All repairs and services are done by the technical department.**
- ✓ **No watching of pornography or any form of controversial content.**
- ✓ **All external storage media like flash discs must scanned first before use.**
- ✓ **Use of computers for external work must be with permission.**

2) a) Write short notes on the following types of AC power fluctuations.

i) Blackout: **is the complete loss of AC power**.
ii) Noise: **is a reduction in voltage level of AC power that lasts for a period of time.**
iii) Brownout: **is a dramatic increase in voltage above the normal flow of electrical current.**
iv) Power surge: **is an interference from generators and lightning**.

b) Explain how each of the above AC power fluctuations can be prevented.

- ✓ **Install Surge protector to protect against damage from surges and spikes.**
- ✓ **Install Uninterruptible power supply (UPS) to provide a consistent quality of power when brownouts and blackouts occur.**
- ✓ **Install a Standby power supply (SPS) to provide a backup battery that will supply power when the incoming voltage drops below the normal level.**

- ✓ **Install a power stabilizer to maintain power at required voltages.**

3) a) Define term **Troubleshooting**.
   - ✓ **Troubleshooting is the process of identifying the source of a problem.**

   b) Outline **four** troubleshooting techniques.
   - ✓ **Restart/Reboot or press Ctrl alt Del on the keyboard.**
   - ✓ **Safe Mode booting.**
   - ✓ **Cable and signal checks.**
   - ✓ **System recovery/restore.**
   - ✓ **Taking notes about error messages.**
   - ✓ **Virus check.**
   - ✓ **Power supply check.**

4) a) Define the term **Preventive Maintenance**.
   - ✓ **Preventive maintenance is the practice of replacing components before they fail in order to promote continuous system operation.**

   b) State **four** importance of servicing and preventive maintenance of computers.
   - ✓ **It helps to detect earlier problems that may cause system start-up errors.**
   - ✓ **It helps to keep the computer clean from dirt, dust and debris.**
   - ✓ **Out dated software like the antivirus, operating system etc. are updated thereby improving the computer speed.**
   - ✓ **Faulty hardware is removed and replaced with new ones thereby preventing system failure.**
   - ✓ **Unwanted files and temporary file are deleted thereby improving on the performance of computer programs.**
   - ✓ **It helps to keep the anti-virus software up to date thereby preventing data loss as a result virus corruption.**
   - ✓ **It ensures that the files on the hard disc are not fragmented (moved on one side of the disc) thereby increasing efficiency.**

   c) Outline **four** activities involved in servicing and maintenance of computers.
   - ✓ **Repairing and replacing damaged parts.**
   - ✓ **Upgrading and updating software.**
   - ✓ **Deleting junk files and temporary files.**
   - ✓ **Installing power guards/surge protectors.**
   - ✓ **Scanning storage media like hard discs.**
   - ✓ **Disk cleaning and disc defragmentation.**
   - ✓ **Activating Firewall.**
   - ✓ **Blowing dust off/Removing dirt and dust.**
   - ✓ **Installing software like operating system, antivirus software etc.**

   d) Mention **four** tools used in maintenance of computers.
   - ✓ **Soft cloth or brush**
   - ✓ **Dryer sheets**
   - ✓ **Compressed air**
   - ✓ **Vacuum cleaner**
   - ✓ **Antimicrobial wipe**
   - ✓ **Keyboard duster**

FILE MANAGEMENT

1) a) Define the following terms as used in the file management.
   i) File: **is a collection of related information that is given a name.**
   ii) File name: **refers to the kind/type of application program that has been used to create a given file.**
   iii) File path: **is a route followed to locate a particular file on a computer storage medium such as a hard disc.**
   iv) File extension: **is commonly a three character addition that follows the name of a file.**
   v) Folder: **is a named storage area in windows operating systems. Or a collection of files.**
   vi) Sub folder: **is a folder located in another folder.**
   vii) Directory: **is a named storage area in non-windows operating system such as DOS.**
   viii) Drive: **is a name given to a particular storage medium where a file or folder can be created and stored.**

   b) State and explain **three** functions of a file manager.
   - ✓ **File manager:** is a computer program that provides a user interface to manage files and folders.

   Functions of a file manager
   - ✓ **Navigation**: it has a navigation system that lets users proceed through the file hierarchy to the level where they can find their work.
   - ✓ **Security**: it can restrict access to itself or to particular files with log-in procedures.
   - ✓ **Search**: it includes a "Search" function that helps users find particular files stored on the computer.

2) Use the phrase below to answer questions that follow.
   C:\Users\ABELS\Desktop\REVISION TOOLS 2023\TOPICAL QUESTIONS.pdf.
   a) State the suitable name for the above phrase: **File path**
   b) State the;
   i) File name: **TOPICAL QUESTIONS**
   ii) File Extension: .**pdf**
   iii) File type: **Portable Data Format file**
   iv) Folder in which the file is stored: **REVISION TOOLS 2023**
   v) Profile/account used: **ABELS**
   vi) Disc partition/Drive on which the file is stored: **C**
   vii) Actual location of the file: **Desktop**

   c) Write the acronym **pdf** in full. Give reasons why it's used in file management.
   - ✓ **pdf** stands for **Portable Data Format**

   Reasons for converting files to pdf
   - ✓ **Pdf files can open on all operating systems.**
   - ✓ **Pdf maintains the document format.**
   - ✓ **More space on the disc is saved since Pdf files are compressed.**
   - ✓ **Pdf files are absolutely secure to be shared on the internet.**
   - ✓ **Pdf files can be protected with a password.**

   d) List **five** file extensions with their corresponding programs.

File extension	Program it represents
.docx	Microsoft word file
.xlsx	Microsoft Excel file

.pptx	Microsoft Power Point file
.accdb	Microsoft Access file
.pub	Microsoft Publisher file
.exe	Executable file
.bat	Batch file
.wav, .mp3	Audio file
.mpeg, mp4	Video file
Jpeg, png	Image file

3) a) Using windows operating system, outline the steps taken to:

i) Create a folder on DESKTOP called **AAA**

- ✓ **Right click on the Desktop, Go to "New", Select "Folder", without clicking anywhere, type the folder name "AAA"**

ii) Change the folder name from **AAA** to **ATIM ABEL ATIM**.

- ✓ **Click in the folder named "AAA", Right Click in it, Select "Rename", immediately type the new folder name "ATIM ABEL ATIM"**

iii) Save a music file onto a flash disk named **MY BACKUP**.

- ✓ **Connect the flash disc, Select and Right click in the music file you want to send, Go to "Send To", Select the disc named "MY BACKUP"**

b) Write down the error that is likely to show up when;

i) One tries to save a file with a file name similar to one that already exists in the folder being saved into.

- ✓ **There is already a file with the same name in this location.**

ii) One tries to use a symbols such as /*:"<>| while naming a file or folder.

- ✓ **A file name can't contain any of the following characters /*:"<>**

iii) One tries to open a file that was deleted.

- ✓ **Sorry, we couldn't find your file. Is it possible it was moved, renamed or deleted?**

iv) One tries to move a minimized file on the task bar to a new storage location say flash memory.

- ✓ **File in Use. The action can't be completed because the file is open in Word (desktop).**

v) One tries to delete a file or folder that is open.

- ✓ **File in Use. The action can't be completed because the file is open in Word (desktop).**

COMPUTER HARDWARE

1) Computer hardware describes the physical components of a computer. Basically there are four major categories namely; **Input Hardware, Output Hardware, Storage Hardware** and **Processing Hardware**. Given the following hardware devices.

Monitor, Flash Memory, Keyboard, Projector, Processor/CPU, Trackball, Interactive White Board, Optical Scanner, Mouse, Plotter, Touch Pad, Touchscreen, Magnetic Tape, Printer, Optical Mark Recognition (OMR) Reader, Fax Machine, Magnetic Stripe Reader, Magnetic Tape, Optical Character Recognition (OCR) Reader, Optical Discs, Barcode Reader, Floppy Disc, QR (Quick Response) Code Reader, Large Format Printer, Zip Disc, Light Pen, Head Phones, Terminal, Magnetic Ink Character Recognition (MICR) Reader, Jaz Disc, Multifunction Device, Dictaphone.

a) Place each under a category it best suits.

Input Hardware	Output Hardware	Storage Hardware	Processing Hardware
✓ **Keyboard**	✓ **Monitor**	✓ **Flash Memory**	✓ **Processor**
✓ **Trackball**	✓ **Projector**	✓ **Magnetic Tape**	
✓ **Interactive White Board**	✓ **Interactive White Board**	✓ **Optical Discs**	
✓ **Optical Scanner**	✓ **Plotter**	✓ **Floppy Disc**	
✓ **Mouse**	✓ **Touchscreen**	✓ **Zip Disc**	
✓ **Touch Pad**	✓ **Printer**	✓ **Jaz Disc**	
✓ **Touchscreen**	✓ **Fax Machine**		
✓ **OMR**	✓ **Large Format Printer**		
✓ **Fax Machine**	✓ **Head Phones**		
✓ **Magnetic Stripe Reader**	✓ **Terminal**		
✓ **OCR**	✓ **Multifunction Device**		
✓ **Barcode Reader**			
✓ **QR Code Reader**			
✓ **Light Pen**			
✓ **Terminal**			
✓ **MICR**			
✓ **Multifunction Device**			
✓ **Dictaphone**			

b) In the above list, select **five** devices that can be used to both input data and output information.
- ✓ **Interactive White Board**
- ✓ **Touchscreen**
- ✓ **Fax Machine**
- ✓ **Terminal**
- ✓ **Multi-Function Device**

c) Give the function and application area for each of the following devices.

i) OMR: **is a device that reads pencil marks and convert them into computer usable form before entering them into the computer. It's Used read questionnaires, multiple choice examination papers.**

ii) OCR: **is a device that enables a computer to recognize written or printed characters. It is used in utility bills and price tags on departmental store merchandise.**

iii) MICR: **is a device used to read the special magnetic ink that banks use to print details on the bottom of cheques. It is used to process cheques in banking operations.**

iv) Barcode Reader: **is a hand-held input device used to capture and read information contained in a barcode. It is used in supermarkets, book shops, medical stores and departmental stores.**

2) a) Outline the **two** major classification of printers giving **three** examples of printers under each.
- ✓ **Impact Printers**: are printers that produce a hard copy output with the print heads physically touching the print media.
  Examples of Impact printers: Dot matrix printer, Daisy wheel printer. Line printer.
- ✓ **Non-Impact Printer:**are printers that produce a hard copy output without the print head touching the P.media.

Examples of non-impact printer are: LaserJet printer, Inkjet printer, Thermal printer.

b) Give **three** merits and demerits of each of the above mentioned printer classification.

Impact Printers	
Merits/Advantages	**Demerits/Disadvantages**
✓ They are relatively cheap	✓ They are generally noisy
✓ They can withstand dirty environment	✓ They are relatively slow
✓ They can make multiple copies with multipart paper	✓ They produce a poor quality output.

Non-Impact Printers	
Merits/Advantages	**Demerits/Disadvantages**
✓ They are generally quiet during printing.	✓ They are very expensive to buy.
✓ They are relatively fast during printing.	✓ There are high maintenance costs.
✓ They produce high quality output.	

3) Define the following memories.
   i) RAM (Random Access Memory): **is the working area during the processing of data. RAM is temporary, volatile, can read and write in it, it can also be changed or increased.**
   ii) ROM (Read Only Memory): **it contains the BIOS (Basic Input/Output System), which is a sequence of instructions the computer follows to load the operating system and other files when the computer is switched on. ROM is non-volatile, can only be read and the information stored in it is permanent.**
   iii) CMOS memory: **is a memory chip that stores configuration information about the computer. It uses the battery power to retain information when the power to the computer is off.** Some of the configuration information stored in CMOS memory include: **current date and time, amount of RAM installed, types of disc drives installed, type of the monitor and keyboard etc**.
   iv) Buffer memory: **is a RAM component that is used for temporary storage of data waiting to be sent to a device.**
   v) Cache memory: **is a type of memory that stores frequently used files and application programs.**
   vi) Virtual memory: **is a section of volatile memory created temporarily on the available permanent storage medium (hard disc).**

4) a) Define the following terms as used in computer storage. Give examples where necessary.
   i) Storage medium: **refers to the physical equipment that stores data or information.** Examples of storage media; **Compact Disc, Hard Disc, Floppy Disc, Magnetic Tape etc**.
   ii) Storage device**: is a device that records and retrieves data or information to and from a storage medium.** Examples of storage devices; **DVD/CD Drive, Hard Disc Drive, Floppy Disc Drive, Magnetic Tape Drive etc**.
   iii) Memory: **is a temporary area for holding data, instructions, and information**.
   iv) Reading**: is the process of transferring data, instructions, and information from a storage medium into memory.**
   v) Writing: **is the process of transferring data, instructions, and information from memory to a storage medium.**
   vi) Access time: **is the amount of time it takes a storage device to locate an item on a medium**.
   vii) Spooling: **is the process of putting tasks that need to be done into a buffer until they can be executed**.

   b) Distinguish between
   i) **Sequential Access** and **Random Access** methods of accessing data on storage media.

- ✓ **In Sequential Access**, records are stored one after the other and, in order to access a record, the computer has to go through all the previous records **while** in **Random Access**, records are also stored one after the other but each record can be accessed directly.

ii) **EBCDIC** and **ASCII** coding schemes.

- ✓ **EBCDIC** (Extended Binary Coded Decimal Interchange Code) uses eight-bit codes to encode every symbol **while ASCII** (American Standard code for Information Interchange) uses 7 bits to encode every symbol.

c) With examples, explain **four** categories of secondary storage media.

- ✓ **Magnetic storage media:** store data in the form of tiny magnetized dots. Examples of magnetic storage media; Fixed hard discs, Potable Hard Discs, Magnetic tapes, Floppy discs, Zip disk, Jaz disks etc.
- ✓ **Optical storage media:** store data as patterns of dots that can be read using light. Examples of optical storage media; CD-ROM, DVD-ROM, Blue Ray, HD-DVD, CD-R/DVDR, CD-RW/DVD-RW etc.
- ✓ **Solid State Storage Media**: are based on electronic circuits with no moving parts. They store data using a special type of memory called the flash memory. Examples of solid state storage media; USB Memory stick/Flash Disc, Memory cards, Smart cards etc.
- ✓ **Online Storage/Cloud Storage**: refers to the practice of storing data on remote servers accessed via the internet, or cloud. Examples of cloud storage service providers; Dropbox, Google Drive, OneDrive, iCloud, NextCloud, SpiderOak, IDrive, pCloud

5) a) Define a CPU.

- ✓ **A CPU is the electronic device that interprets and carries out the instructions that tell the computer how to work.**

b) Give **three** types of CPU.

- ✓ **AMD processors**
- ✓ **Intel processors**
- ✓ **ARM Processors**

c) Outline the **three** major components of the CPU giving the function of each.

- ✓ **Control unit (CU):** controls the operations of all parts of the computer.
- ✓ **Arithmetic Logical Unit (ALU):** performs the arithmetic, comparison, and logical operations.
- ✓ **Registers:** are high speed temporary memory locations for holding data and instructions.

d) State **four** functions of a CPU.

- ✓ **Executes stored instructions.**
- ✓ **Tells the rest of the computer system what to do.**
- ✓ **Executes arithmetic calculation and data manipulation.**
- ✓ **Holds data and instruction which are in the current use.**

6) a) What is a **machine cycle**?

- ✓ **These are steps performed by the computer processor for each machine language instruction received.**

b) State and explain the **four** major operations of the machine cycle (CPU).

- ✓ **Fetch**: involves retrieving a program instruction or data item from memory.
- ✓ **Decode**: involves translating the fetched instruction into commands that the computer understands.
- ✓ **Execute**: involves carrying out the commands.
- ✓ **Storage**: involves sending and writing the results of execution back into memory.

7) a) Write short notes on the following.

i) System unit: **is the enclosure for all the other main interior components of a computer.**

ii) Motherboard: **is a Printed Circuit Board which acts as the main platform for communication between all other components of a system.**

iii) Power supply unit: **converts Alternating Current (AC) to Direct current (DC) to run the internal components of a computer.**

iv) Expansion slot: **is a socket on the motherboard where an expansion card is inserted.**

v) Expansion card: **is an electronic card that is used to add extra functionality to a computer. It is inserted into the expansion slot on the motherboard.**

vi) Port: **is an interface on a computer to which you can connect a device.**

vii) Connector: **is the part of a cable that plugs into a port.**

b) Give **three** examples of:

i) System unit components

- ✓ **The power supply**
- ✓ **RAM chips**
- ✓ **Expansion cards**
- ✓ **The CPU**
- ✓ **Expansion slots**
- ✓ **Fixed Hard disc**

ii) Expansion slots

- ✓ ISA (**Industry Standard Architecture**) Slots
- ✓ PCI (**Peripheral Component Interconnect**) Slots
- ✓ PCI express (**PCIe**) Slot
- ✓ AGP (**Accelerated graphics port**) slot.

iii) Expansion cards

- ✓ **Sound card**
- ✓ **Network card**
- ✓ **Video card**
- ✓ **Modem card**

iv) Ports

- ✓ **Serial Port:** connects older computer mouse and external modem to the computer.
- ✓ **Parallel Port:** connect older printers to the computer.
- ✓ **Universal Serial Bus (**USB**) Port:** can connect up to 127 different USB peripheral devices with a single connector type, greatly simplifying the process of attaching.
- ✓ **VGA (**Video Graphics Array**) Port:** connects monitor or projector to a computer's video card.
- ✓ **PS/2 Port:** Used for old computer keyboard and mouse.
- ✓ **Fire wire Port:** Connects camcorders and video equipment to the computer.
- ✓ **Ethernet Port:** Connects to a network and high speed Internet.

8) a) Define a **bus**.

- ✓ **A bus is a common pathway through which information flows from one computer component to another.**

b) Write short notes on the following bus types.

i) Control bus: **is used to control signal generated by CPU to different part of the system.**

ii) Data bus: **is used to transfer the data between main memory and CPU.**
iii) Address bus: **is used to access a particular memory location by putting the address of the memory location.**

COMPUTER SOFTWARE

1) a) Define the term **software**.
   - ✓ **Software is a set of programs, which is designed to perform a well-defined function.**

   b) Give **three** characteristics of software.
   - ✓ **Functionality:** is the degree of performance of the software against its intended purpose.
   - ✓ **Reliability:** is the ability of the software to provide desired functionality under the given conditions.
   - ✓ **Usability:** refers to the extent to which the software can be used with ease.
   - ✓ **Efficiency:** is the ability of the software to use system resources in the most effective and efficient manner.
   - ✓ **Maintainability:** refers to the ease with which the modifications can be made in a software system to extend its functionality, improve its performance, or correct errors.
   - ✓ **Portability:** is the ability of software to function properly on different hardware and software platforms without making any changes in it.

   c) Computer software is broadly categorized into two namely; **System** and **Application** software. Briefly explain each category.
   - ✓ System software: **is a collection of programs designed to operate, control, and extend the processing capabilities of the computer.**
   - ✓ Application software: **is a collection of programs designed to satisfy a particular need of a particular environment.**

2) a) Define the following categories of system software.
   i) Operating system: **is a program that acts as an interface between the application software and the computer hardware.**
   ii) Utility programs: **are service programs that improve on the general performance of the computer.**
   iii) Programming languages: **refers to a set of words or symbols used to write programs (instructions) for the computer.**

   b) Give **four** functions of each system software category.

   Functions of operating system
   - ✓ **Serves as the interface between the user and hardware through GUI.**
   - ✓ **Manages and allocates memory space for applications.**
   - ✓ **Configures and manages internal and peripheral devices.**
   - ✓ **Responsible for security management of files and applications.**
   - ✓ **Manages input and output devices.**
   - ✓ **Detects, installs, and troubleshoots devices.**
   - ✓ **Produces error messages and troubleshooting options.**

   Functions of utility programs
   - ✓ **Backup/coping utility makes duplicate copy of the content on the disk.**
   - ✓ **Data recovery utility restores data that has been physically damaged or corrupted by the virus.**
   - ✓ **Merging utility combines data from more than one file into a single file.**
   - ✓ **Debuggers are used during program testing.**
   - ✓ **Virus protection utility detects and removes computer viruses.**

- ✓ **File compression utility reduces on the size of the file thereby creating more space on a disc.**
- ✓ **Sorting utility re-arranges data in any order specified by the user.**

Functions of programming languages

- ✓ **Used in writing computer programs.**

c) Explain the **three** major categories of Operating system giving three examples in each.

- ✓ **Stand-alone Operating System:** is a complete operating system that works on a personal computer (PC). **E.g. Mac OS, UNIX, Linux, MS-DOS, Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10 etc.**
- ✓ **Network Operating System (NOS):** is an operating system that support a network and typically resides on the server. **E.g. Windows Server 2003, 2008, Solaris, Novel Netware, UNIX Server, Linux Server etc**.
- ✓ **Embedded Operating System:** is an operating system that resides on ROM chips and typically used in handheld computers and small devices. **E.g. Windows Embedded CE, Windows Mobile, Android OS, Palm OS, Embedded Linux and Symbian OS.**

3) a) Define software **interface**.

- ✓ **A software (user) interface controls how users enter data and instructions and how information is displayed on the screen.**

b) Give and explain the **two** major types of software interface.

- ✓ **Command Line Interface (CLI),** With CLI the user types key words or presses special keys on the key board to enter data and issue instructions to the computer.
- ✓ **Graphical User Interface (GUI),** this allows a user to use menus and visual images such as icons, buttons and other graphical objects to issue Commands.

c) State **two** merits and demerits of each interface.

Command Line Interface (CLI)	
Merits/Advantages	Demerits/Disadvantages
✓ **Very fast in executing commands since the commands can be entered directly using the key board.**	✓ **It's difficult to learn and memorize commands.**
✓ **It takes up little memory and normally does not require a very fast processor.**	
✓ **Many commands can be grouped into a batch file to automate repetitive tasks.**	

Graphical User Interface (GUI)	
Merits/Advantages	Demerits/Disadvantages
✓ **No need to type and memorize any command language.**	✓ **Normally requires more memory and a faster processor.**
✓ **It is more attractive to non-technical people.**	✓ **Occupies more disk space to hold all the files for different functions.**
✓ **Different applications usually have similar interface.**	✓ **It is difficult to automate functions for expert users.**

d) In each type of interface, outline **three** operating system that provide such interface.

Examples of Operating System that provide CLI

- ✓ **UNIX**
- ✓ **Linux**
- ✓ **DOS**

Examples of Operating System that provide GUI

- ✓ **Microsoft Windows. Like Windows XP, Windows 7, Windows 8, Windows 10 etc.**
- ✓ **MAC INTOSH (Mac OS).**

4) Define the following forms of software.

i) Freeware: **is a copyrighted software obtained at no cost (not sold).**

ii) Shareware: **is a copyrighted obtained freely and used for a trial period of time. The user is meant to pay once the trial period elapses.**

iii) Open source: **is a software that is designed primarily to meet user needs and is offered free to install, distribute and modify.**

iv) Adware: **is software that automatically displays or downloads advertising material (often unwanted) when a user is online.**

v) Spyware: **is a software that enables a hacker to obtain private information about another's computer activities by transmitting data stealthily from their computer.**

vi) Driver: **is a small program that tells operating system how to communicate with a device.**

INTERNET AND WORLD WIDE WEB (WWW)

1) a) Define the terms below.

i) Internet: **is a worldwide collection of networks linked together.**

ii) Internet Service Provider (ISP): **is a company that supplies connections to the Internet, usually for a monthly fee.**

b) Apart from the ISP, outline **four** requirements for accessing the internet.

- ✓ **NIC (Network Interface Card)**
- ✓ **Modem**
- ✓ **A computer or any other device like a phone**
- ✓ **Browser**
- ✓ **An Operating System**

c) List **four** ISP in Uganda.

- ✓ **MTN**
- ✓ **Airtel**
- ✓ **Africel**
- ✓ **Vodafone**
- ✓ **UTL**
- ✓ **K2 Telecom**

d) State **four** roles of ISP.

- ✓ **Provide internet access to the user.**
- ✓ **Provides internet services like email.**
- ✓ **Act as a mediator between the user and internet.**
- ✓ **Provide technical support to users.**

- ✓ **Provide local telephone numbers.**

e) Give **four** factors to consider when choosing ISP.

- ✓ **Bandwidth.**
- ✓ **Past experience.**
- ✓ **Services provided.**
- ✓ **Cost for Internet access.**
- ✓ **Technical support.**

2) a) Outline **four** merits and demerits of using the internet.

Merits/advantages

- ✓ **It allows access to a wealth of information, such as news, weather reports etc.**
- ✓ **It enables one to download files, listen to music, and watch movies free of charge.**
- ✓ **Access sources of entertainment and leisure, such as online games, magazines etc.**
- ✓ **It has powerful search engines that enable users locate specific data in a short time.**
- ✓ **It provides message boards where people can discuss ideas on any topic.**
- ✓ **The internet provides the ability of e-mails. Free mail service to anyone in the country. Therefore, communication is made simple and cheaper for a user.**
- ✓ **Friendships and love connections have been made over the internet by people involved in love/passion over similar interests.**
- ✓ **It enables one to shop for goods and services online i.e. e-commerce.**

Demerits/Disadvantages

- ✓ **There is a lot of wrong information on the internet.**
- ✓ **There are predators that hang out on the internet waiting to get unsuspecting people in dangerous situations.**
- ✓ **Some people are getting addicted to the internet and thus causing problems with their interactions of friends and loved ones.**
- ✓ **Pornography that can get in the hands of young children too easily.**
- ✓ **Easy to waste a lot of time on the internet.**
- ✓ **There are a lot of unscrupulous businesses that have sprung up on the internet to take advantage of people.**
- ✓ **Hackers can create viruses that can get into your personal computer and ruin valuable data.**
- ✓ **Hackers can use the internet for identity theft.**

b) List **four** factors affecting the internet speed.

- ✓ **Internet Traffic**
- ✓ **Band width of the communication media**
- ✓ **Speed of the internet service provider's server**
- ✓ **Computer processing speed**
- ✓ **Capacity of communication device being used**
- ✓ **Use of outdated software**
- ✓ **Network topology**

c) Write short notes on the following internet services.

i) World Wide Web (WWW): **is a system of Internet servers that support the HTML documents.**

ii) E-mail: **is a service for the transmission of messages to one or more recipients over a network.**

iii) Newsgroups (discussion group): **is an online area where users conduct written discussions about a particular subject.**
iv) Message boards (discussion board): **is a Web-based type of discussion group that does not require a newsreader program.**
v) Internet Relay Chat (IRC): **is a real-time conference system that discusses/chats on specific topics that suits your interest using text messages.**
vi) Internet telephony: **is a Web-based telephone service that allows a user to talk to others for just the cost of the Internet connection.**
vii) Chat rooms: **is a location on an Internet server that permits users to chat with each other.**
viii) Instant messaging: **is a real-time communications service that notifies a user when one or more people are online and then allows the user to exchange messages or files with them.**
ix) Telnet: **is an internet service that allows a user to log onto a remote device.**
x) Videoconferencing: **is a meeting between two or more geographically separated people who use a network or the Internet to transmit audio and video data.**

3) a) Define the following terms as used online:
i) Uniform Resource Locator (URL): **is an internet address that is used to access a website.**
ii) Search engine: **is a software program that can be used to find Web sites, Web pages, and files on the Internet.**
iii) Web browser: **is a software program used to access and view Web pages.**

b) Give **two** examples of;
i) Search engine: **Google, Yahoo, Excite, HotBot, Askme etc.**
ii) Web browser: **Internet Explorer, Mozilla Firefox, Opera, Google Chrome, Safari etc.**

4) Using the phrase below, answer the following questions:

https://www.kyu.ac.ug

a) Give a suitable name for the above phrase: **Uniform Resource Locator (URL)**
b) Identify the protocol used, Domain name, Top Level Domain and location.
- ✓ Protocol used: **https**.
- ✓ Domain name: **www.kyu.ac**
- ✓ Top Level Domain: **.ac**
- ✓ Location: **Uganda**

c) Why are most websites changing from ***http*** to ***https***?
- ✓ **It is because information transmitted via https is secured (encrypted) therefore cannot be understood by a whoever taps it during transmission while information transmitted via http is left in plain text therefore can be understood by whoever taps it during transmission.**

d) Write short notes on the following types of websites.
i) Blog: **is an informal Web site consisting of time-stamped articles or posts in a diary or journal format.**
ii) Wiki: **is a collaborative Website that allows users to create, add, modify, or delete its contents.**
iii) Web portal: **is a site that provides a starting point or a gateway to other resources on the Internet.**
iv) Social networking websites: **is a Website that encourages members in its online community to share their interests, ideas, stories, photos, music, and videos with other registered users.**

5) Use the Phrase below to answer the questions that follow:

atimabelatim@gmail.com

a) Give the above phrase a suitable name: **E-mail Address**

b) Identify what these parts stand for:

i) atimabelatim: **Username**

ii) @: **is a symbol for "at", it separates the user name from Domain name**

iii) Gmail: **Domain name**

iv) .com: **Top Level Domain (TLD)**

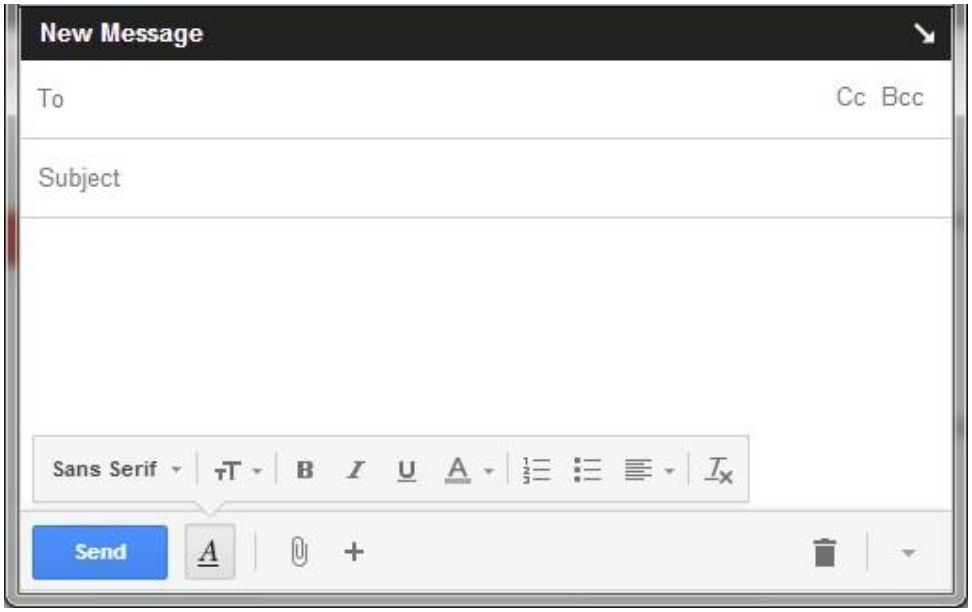
6) a) Define the term **E-mail Software**.

- ✓ **E-mail software is a program that users use to create, send, receive, forward, store, print, and delete e-mail messages.**

b) Outline **four** examples of E-mail software.

- ✓ **Microsoft Outlook**
- ✓ **Lotus Domino**
- ✓ **Quick mail office**
- ✓ **Eudora Pro.**
- ✓ **Windows Live Mail**
- ✓ **Mozilla Thunderbird**

c) Below is a snapshot of an email window. Study it carefully and answer the questions that follow.



State the purpose of the following

i) To: **This is where the user writes the e-mail address of the recipient of the email.**

ii) Cc: **Makes a copy of work to other recipients, but all will know that others have received a copy of the e-mail.**

iii) Bcc: **Makes a copy of an e-mail to other recipients, but all will not know that others have a copy of the same e-mail.**

iv) Subject: **This is where the user writes the title or heading of the message.**

v)  : **This is an Attachment symbol, it enables a user to attach a file to an electronic message.**

d) Outline **four** E-mail etiquettes.

- ✓ **Do not access or disclose other people's e-mail without prior consent.**
- ✓ **Always read the message before sending to check for spelling and grammar errors.**
- ✓ **Do not use all capitals when typing since it is difficult to read and is sometimes termed as shouting.**
- ✓ **Keep your message brief for easy reading and understanding by your recipients.**

- ✓ **Have an appropriate subject as this encourages the recipient to open and read the message.**
- ✓ **Do not Spam that is mass electronic mailing for the purpose of advertising.**
- ✓ **Do not forward angry messages.**
- ✓ **Read your mails on a daily basis so as to respond to your recipients when it is still appropriate.**

e) State and explain **four** cyber-crimes.

Cybercrime refers to online or Internet-based illegal acts. These include:

- ✓ **Child pornography:** involves making or distributing child pornography.
- ✓ **Cyber terrorism:** involves hacking, threats, and blackmailing towards a business or person.
- ✓ **Cyber bully or Cyber stalking:** means harassing others online.
- ✓ **Creating Malware:** involves Writing, creating, or distributing malware (e.g. viruses and spyware.)
- ✓ **Denial of Service attack:** involves overloading a system with so many requests it cannot serve normal requests.
- ✓ **Espionage:** means spying on a person or business.
- ✓ **Fraud:** involves manipulating data, e.g. changing banking records to transfer money to an account.
- ✓ **Identity theft:** means pretending to be someone you are not.
- ✓ **Intellectual property theft:** means stealing practical or conceptual information developed by another person or company.
- ✓ **Hacking:** involves illegally circumventing security to access someone else's computer system.
- ✓ **Phishing:** involves getting a user to enter personal information via a fake website.
- ✓ **Pharming:** is the process of redirecting users to a fraudulent copy of legitimate website, again with the aim of stealing personal data and passwords for criminal intent.
- ✓ **Salami slicing:** means stealing small amounts of money from each transaction.
- ✓ **Scam:** means tricking a person into believing something that is not true.
- ✓ **Spamming:** involves sending unsolicited e-mail to hundreds of different addresses.
- ✓ **Spoofing:** means deceiving a system into thinking you are someone you really are not.
- ✓ **Unauthorized access:** means gaining access to systems you have no permission to access.
- ✓ **Wiretapping:** involves connecting a device to a phone line to listen to conversations.
- ✓ **Piracy:** is the copying and distribution of programs, movies, music or other intellectual property without permission.

7) a) Define the term **Cloud Computing**.

- ✓ **Cloud computing is the practice of storing and accessing data as well as programs on remote web servers accessed via the internet or cloud other than the computer local hard disc.**

b) Outline **three** cloud service providers.

- ✓ Dropbox
- ✓ Google Drive
- ✓ Mega
- ✓ OneDrive
- ✓ iCloud
- ✓ NextCloud
- ✓ SpiderOak
- ✓ IDrive
- ✓ pCloud

c) Give **three** merits and demerits of cloud computing.

Merits/Advantages	Demerits/Disadvantages
✓ **Data can be accessed from anywhere provided you have internet connection.**	✓ **It requires strong internet connection.**
✓ **Data can be shared easily.**	✓ **There is need for training in managing cloud storage.**
✓ **It provides a quick recovery of data.**	✓ **Users have no full control over their data.**
✓ **Automatic data backup can be scheduled.**	✓ **It is costly for smaller companies.**

DATA COMMUNICATION AND NETWORKING

1) a) Define the following terms as used in data communication.
   i) Data communication: **is the exchange of digital information between two or more digital devices.**
   ii) Bandwidth: **is the maximum amount of data that a transmission medium can carry at per second.**
   iii) Throughput: **is the number of messages successfully delivered per unit time.**
   iv) Transmission medium: **is the path through which a message travels from sender to receiver.**
   v) Latency: **is the amount of time it takes a packet to travel from source to destination.**
   vi) Attenuation: **is a decrease in magnitude and energy as a signal progressively moves along a transmission medium.**
   vii) Packet: **is a piece of a message transmitted over a packet-switching network.**
   viii) Packet switching: **is a digital network transmission process in which data is broken into suitably-sized pieces or blocks for fast and efficient transfer via different network devices.**

   b) State and explain the components/elements of a data communication system/model.
   - ✓ **Transmitter:** is the device that sends the message.
   - ✓ **Receiver:** is the device that receives the message.
   - ✓ **Medium:** is the path through which a message travels from sender to receiver.
   - ✓ **Message:** is the data to be communicated.
   - ✓ **Protocol:** is a set of rules that governs data communication.

2) a) Explain the following transmission modes giving **two** application areas for each:
   i) Simplex: **communication occurs only in one direction.** Application areas; **Television broadcast, Radio broadcast, Keyboard transmission, Pagers, Temperature sensors, Doorbell etc.**
   ii) Half duplex: **communication occurs in both direction BUT one at a time.** Application areas; **Radio call, Fax machines, Credit card verification systems, Automated teller machines etc.**
   iii) Duplex: **communication occurs in both direction at the same time.** Application areas; **regular telephone line, Computers etc.**

   b) State the difference between following types of transmission giving **one** application area for each.
   i) Serial transmission and parallel transmission.
   - ✓ In Serial Transmission, **data is sent bit by bit** while in Parallel Transmission, **various bits are sent together at the same time.**

     Application area
   - ✓ Serial Transmission: **Used for long distance communication. E.g. Computer to computer.**
   - ✓ Parallel Transmission: **Used for Short distance communication. E.g. computer to printer.**

   ii) Asynchronous transmission and Synchronous transmission.

- ✓ In Asynchronous Transmission, **data is sent 1 byte or a character at a time** while in Synchronous transmission, **data is sent in blocks.**
- ✓ Examples of Asynchronous Transmission: **Letters, emails, forums, televisions and radios.**
- ✓ Examples of Synchronous Transmission: **Chat Rooms, Video Conferencing, telephonic conversations, as well as face to face interactions etc.**

3) a) The term Computer Network can be defined as the interconnection of computers for the purpose of communication and resource sharing.

a) Outline **four** resources that can be shared on a network.

- ✓ **Software**
- ✓ **Modems**
- ✓ **Printers**
- ✓ **Storage devices**
- ✓ **Fax machines**
- ✓ **Communication links**

b) Give **four** merits and demerits of computer networks.

Computer Network	
Merits/Advantages	Demerits/Disadvantages
✓ **Facilitates hardware sharing, many users share one printer.**	✓ **Buying the computer cable and servers is very expensive.**
✓ **Facilitates data sharing, data can be shared through Emails, VoIP, Video conferencing etc.**	✓ **Viruses are easily spread to other computers on a computer network.**
✓ **Facilitates software sharing, software is installed on a server and can be updated centrally.**	✓ **System becomes open to hackers.**
✓ **Facilities work group activities, a group of users can work together on a single project.**	✓ **Network faults can cause loss of data.**

4) Explain the following network types.

i) Local Area Network (LAN): **is a network that covers a relatively small area such as building or a group of adjacent buildings.**

ii) Metropolitan Area Network (MAN): **is a network that covers metropolitan area such as a town or city.**

iii) Wide Area Network (WAN): **is a network that spans a relatively large geographical area such as a country or the planet.**

c) Define the following internetworks.

i) Intranet: **is a local version of internet that is privately owned by an organization.**

ii) Extranet: **is an intranet that can be partially accessed by authorized outside users, enabling businesses to exchange information over the Internet securely.**

iii) Internet: **is a wide area network that covers the planet.**

5) a) Distinguish between **peer-to-peer network** and **client server network**.

- ✓ In a peer-to-peer network, **each computer on a network acts as a server for the files stored upon it** while in client-server network, **there is only one computer called the server that supplies resources or responds to requests from other computers called the clients.**

b) Give **two** merits and demerits of using each network model.

Peer-to-Peer Network	
Merits/Advantages	Demerits/Disadvantages
✓ **It is easy and simple to set up.**	✓ **There is no organization to data storage since it can be stored on any computer.**
✓ **There is no need for full-time Network Administrator since users can control their data.**	✓ **It is difficult to administer since the whole system is decentralized.**
✓ **The over-all cost of setting up this network is relatively low since, there is no need to buy an expensive server.**	✓ **Data recovery or backup is very difficult since each computer must have its own back-up system.**
✓ **It is more reliable since if one computer fails to work all the other computers connected to it still continue to work.**	✓ **It does not run efficient if you have many computers.**

Client-Server Network	
Merits/Advantages	Demerits/Disadvantages
✓ **It is easy to Backup data and administer security since the whole system is centralized.**	✓ **Its startup cost is high since you have to buy server computer which are very expensive.**
✓ **Data is organized since it can be accessed from one point (servers) and this provides greater security controls than most clients.**	✓ **There is a reliance on the central server, if it fails, no work can be done.**
	✓ **A network administrator is required and this costs money.**
	✓ **There is lots of network traffic.**

6) a) Write notes on the following networking requirements.

i) Workstations and nodes: Workstations **are computers on a network.** Nodes **are all devices on a network.**

ii) Communication channels/media: **are paths through which messages travel from sender to receiver.**

iii) Communication software: **is communication software that manages the transmission of data between computers and other devices attached on the network.**

iv) Communication devices: **are devices used as interfaces or junctions between terminal devices.**

b) State and explain;

i) **Three** examples of nodes.

- ✓ **Computers**
- ✓ **Printers**
- ✓ **Multifunction devices Etc.**

ii) **Eight** examples of communication devices.
- ✓ **Repeater:** this accepts a signal from a transmission medium, amplifies it, and retransmits it over the medium.
- ✓ **Gateway:** this connects networks that use different protocols.
- ✓ **Bridge:** this connects two LANs using the same protocol.
- ✓ **Firewall:** this protects a network from unauthorized access.
- ✓ **Router:** this sends (routes) communications traffic to the appropriate network using the fastest available path.
- ✓ **Hub:** this connects multiple computers to the server on a network.
- ✓ **Switch:** this does the same function like a hub but unlike hub, a switch forwards a data packet directly to the address of network device it is intended for without broadcasting.
- ✓ **A multiplexer:** this merges several low speed transmissions into one high-speed transmission.
- ✓ **Network Interface Card (NIC):** this connects computers to a network.
- ✓ **Modem:** Short for MODulator/DEModulator: this converts digital signals to analog and analog signals back to digital.

iii) **Three** examples of bound/guided communication media.
- ✓ **Twisted pair cable:** consists of two independently insulated copper wires twisted around one another.
- ✓ **Coaxial Cable:** consists of a center copper wire surrounded by insulation and then outer channel used as ground.
- ✓ **Fibre Optic Cable:** is made up of thin strands of glass that transmit data signal in a form a beam of light.

iv) **Three** examples of unbound/unguided communication media.
- ✓ **Radio Waves:** they are low-frequency signals and can travel a long distance. They can penetrate through the buildings.
- ✓ **Microwaves:** are transmitted in a straight line and hence require the line-of-sight transmission. The microwave has a frequency higher than the radio waves.
- ✓ **Infrared waves:** are used for short range communication. Like, the remote control for televisions. They cannot penetrate through obstacles.
- ✓ **Communication Satellite:** is a space station that receives microwave signals from an earth-based station, amplifies the signals, and broadcasts the signal back over a wide area to any number of earth-based station.
- ✓ **Bluetooth:** is a wireless technology that uses short radio waves to exchange data over short distances from fixed and mobile devices.
- ✓ **WIFI (Wireless Fidelity):** is a wireless technology that uses radio waves to provide high speed internet and network connections. It works over longer distances than Bluetooth and Infrared.
- ✓ **ZigBee:** is an open global standard for wireless technology designed to use low power digital radio signals for personal area networks. It is slower than Wi-Fi and Bluetooth.

v) **Eight** examples of communication protocol.

Protocols are set of rules and procedures that govern communication between two different devices or computers on the network. They include:
- ✓ **HTTP** (Hyper Text Transfer Protocol): used for sending and receiving web pages to and from web server.
- ✓ **POP** (Post Office Protocol): used by e-mail clients to retrieve emails from a remote server after which the copy of the email is deleted from the server.
- ✓ **IMAP** (Internet Message Access Protocol): used by e-mail clients to retrieve emails from a remote server after which the copy of the email is retained on the server.
- ✓ **SMTP** (Simple Mail Transfer Protocol): used for transferring mail massages and attachments between a mail client and a mail server.
- ✓ **TCP/IP** (Transmission Control Protocol/Internet Protocol): controls and manages the data transmission over the Internet.
- ✓ **IP** (Internet Protocol): controls and manages the data transmission over the Internet.
- ✓ **FTP** (File Transfer Protocol): used for transferring any kind of file to and from the web server.

- ✓ **IRC** (Internet Relay Chat): used for Internet chat and other communications.
- ✓ **TFTP** (Trivial File Transfer Protocol): used for connectionless active file transfer.
- ✓ **SLIP** (Serial line internet protocol): is an encapsulation of the Internet Protocol designed to work over serial ports and modem connections.
- ✓ **DHCP** (Dynamic Host Configuration Protocol): used for providing IP address automatically to client computer through DHCP server.
- ✓ **DNS** (Domain Name System): translates network address (such as IP addresses) into terms understood by humans (such as Domain Names) and vice-versa.
- ✓ **WAP** (Wireless Application Protocol): is a technical standard for accessing information over a mobile wireless network.
- ✓ **PPP** (Point-to-Point Protocol): is a protocol used to establish communication between two computers using a serial interface.
- ✓ **XMTP** (Extended Mail Transfer Protocol): used when any file or document is attached with an e- mail message.
- ✓ **SNMP** (Simple Network Management Protocol): used to manage Network devices on IP networks for example routers, switches, servers, workstations, printers, modem racks etc.

7) a) Distinguish between **physical topology** and **Logical topology**.

- ✓ Physical Topology: **refers to the physical arrangement of components on the network.**
  While
- ✓ Logical/Signal Topology: **refers to the way data is passed from one device to another on the network.**

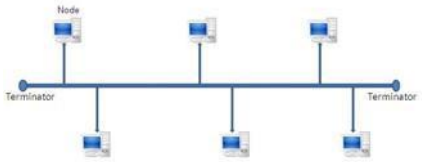
b) State and explain;

i) **Two** examples logical topology.

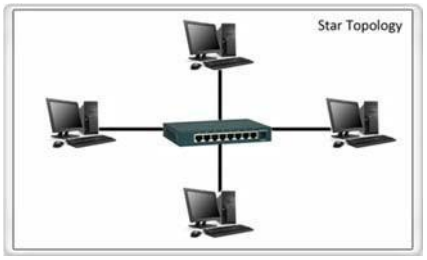
- ✓ **Ethernet topology:** is when all the computers listen to the network media when one computer is sending data.
- ✓ **Token ring topology:** uses a token which is used to exchange data from one PC to another.

ii) **Five** examples of physical topology.

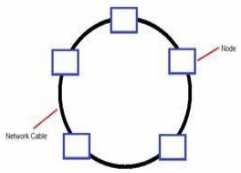
- ✓ **Bus Topology:** has a single line or cable with nodes at different points. i.e. all devices are connected to a central cable called bus or backbone cable.



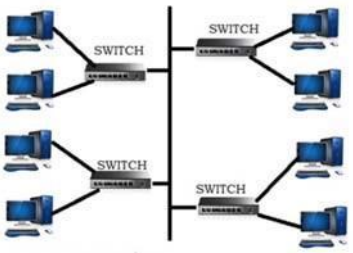
- ✓ **Star topology:** all nodes are individually connected to a central connection point, like a hub or a switch.



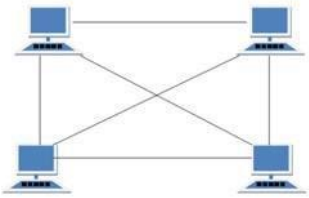
- ✓ **Ring topology:** all the devices are connected to one another in a shape of a closed loop.



- ✓ **Tree/ Hierarchical Topology:** is a hybrid topology. Groups of star-configured networks are connected to a linear bus back-bone.



- ✓ **Mesh Topology,** devices are connected with many redundant interconnections between network nodes. In a true mesh topology every node has a connection to every other node in the network.



SYSTEM STARTUP AND CONFIGURATION

1) a) Define the term **System Start-Up**.
   - ✓ System start-up **refers to the procedure for starting the computer software, namely the operating system, and other programs.**

   b) Write the initial procedure of starting/booting a computer system.
   - ✓ **Switch on the mains.**
   - ✓ **Switch on the UPS or stabilizer.**
   - ✓ **Switch on the system unit.**
   - ✓ **And finally switch on the monitor.**

2) a) Write short notes on the following terms in relation to system startup.
   i) Cold boot: **Means to start a computer that has been completely off.**
   ii) Warm/soft boot: **Means to restart a computer.**
   iii) Hard reboot: **is done by pressing and holding the reset button on a computer for a few seconds.**

   b) Outline **four** stages involved in the booting process of a computer.
   - ✓ **Powering on the PC**
   - ✓ **Power On Self-Test**
   - ✓ **Accessing bootstrap loader**
   - ✓ **Loading O.S in memory**
   - ✓ **Account logon and pass wording**

3) a) State **four** major causes of;
   i) System freeze.
   - ✓ **Outdated software's**
   - ✓ **Insufficient memory or storage space**
   - ✓ **Hardware failure**

- ✓ **Computer Viruses**
- ✓ **Having many peripherals being plugged in**

ii) PC random restart.

- ✓ **System issues, if the operating system encounters an error, the PC can automatically restart.**
- ✓ **Program issues, some programs like games that use up memory can also cause PC random restart.**
- ✓ **Memory issues, if the installed main memory (RAM) is faulty or insufficient, the PC can automatically restart.**
- ✓ **Malware issues such as virus, worm and spyware can also cause random PC restart.**
- ✓ **Power issues, insufficient power supplied to the PC can also cause auto PC restart.**

b) State **three** reasons why some users restart their computers.

- ✓ **To complete the configuration of newly installed software.**
- ✓ **To get the computer system out of freezing.**
- ✓ **To download and install the necessary updates.**

c) Under what circumstances may a user restart his or her computer?

- ✓ **In case one wants to recover it from errors.**
- ✓ **After installing of certain new software program.**
- ✓ **After uninstalling a software.**
- ✓ **After installing a new hardware device like a keyboard.**
- ✓ **After uninstalling a hardware device.**
- ✓ **When the computer slows down.**
- ✓ **After changing CMOS or BIOS setup.**
- ✓ **When a computer locks or freezes.**

4) a) Define the term **System Configuration**.

- ✓ **System configuration refers to how computer components are arranged, and how its options are set.**

b) Describe how the following hardware components can be connected.

- ❖ AC mains socket outlet
- ❖ UPS
- ❖ UPS power cable
- ❖ System unit
- ❖ System unit power cable
- ❖ Monitor
- ❖ Monitor power cable
- ❖ Mouse
- ❖ Keyboard
- ❖ Speakers
- ❖ VGA Cable
- ❖ Printer
- ❖ Printer USB cable
- ❖ Printer power cable

- ✓ **Connect the UPS to the AC mains socket outlet using the UPS power cable.**
- ✓ **Connect the monitor to the UPS using the monitor power cable.**
- ✓ **Connect the system unit to the UPS using the system unit power cable.**

- ✓ **Connect the monitor to the system unit using VGA cable.**
- ✓ **Connect the mouse to the system unit.**
- ✓ **Connect the keyboard to the system unit.**
- ✓ **Connect the speakers to the system unit.**
- ✓ **Connect the printer to the system unit using the printer USB cable.**
- ✓ **Connect the printer to AC mains socket outlet using the printer power cable.**

5) a) Define the term **Computer Specification**.
   - ✓ The specification is a list of the key components that make up the computer.

b) Outline the **three** major Computer Specifications.
   - ✓ **Processor speed**
   - ✓ **Amount of RAM installed**
   - ✓ **Hard disc storage capacity**

c) Mention **two** ways Computer Specifications can be checked.
   - ✓ **Method 1:** Type "dxdiag" into the Start Menu's Search and then press the enter key on the keyboard. It will show you all the specifications of your laptop or desktop.
   - ✓ **Method 2:** Open the Start menu and do a search for Command Prompt. Type "systeminfo.exe" in command prompt and thereafter press the enter key on the keyboard.
   - ✓ **Method 3:** Trace for "This PC" icon on the desktop for computers windows 10 and "Computer" icon for computers using windows XP, Vista, 7 and 8. Select and Right click in that icon. Select properties. It will also help you see some computer specifications.

d) Assuming that one of your friends has bought a computer set with the specifications below. As a student of computer studies/ICT help your friend to understand these specifications as you answer the questions that follow;

SPECIFICATIONS

- ❖ Intel(R) Core (TM) 2.40 GHz.
- ❖ 1GB of SDRAM.
- ❖ 250GB HDD.
- ❖ Super Multi DVD-ROM.
- ❖ 10/100 Base-T Network Interface and 56 Modem
- ❖ Intel(R) HD Graphics. 1280 x 800 (64 bit) LCD Display.
- ❖ Lenovo model 25184HU.
- ❖ Windows 8 Ultimate 64-bit.
- ❖ System architecture 64 bit.
- ❖ Norton Internet Security (3 years subscription), Microsoft Works (OEM), NTI CD-Maker Gold (OEM), Adobe Acrobat Reader 9, Microsoft Office 2013 Home and Student Edition.

i) State this **computer's processing speed**.
   - ✓ **2.40 GHz**

ii) Describe what the **DVD-ROM** will enable him to do.
   - ✓ **It will help him read and write data on both CDs and DVDs.**

iii) Provide evidence for this computer's connectivity ability to a network.
   - ✓ **The presence of a 10/100 Base-T Network Interface and 56 Modem.**

iv) What does **LCD** and **HD** stand for in full?

✓ LCD: **Liquid Crystal Display**

- ✓ HD: **High Definition**

v) How is your friend likely to benefit from LCD and HD display?
- ✓ LCD: **Emits less electromagnetic radiations that would cause eye strain, it also uses less electricity.**
- ✓ HD: **Produces a high quality output (Clear/Sharp images).**

vi) State the **Operating System** supplied with this computer system.
- ✓ **Windows 8 Ultimate 64-bit**

vii) Can this computer support all kinds of Operating system? Why?
- ✓ **Yes**
- ✓ Reason: **it has a 64-bit System architecture that supports all operating systems.**

viii) Identify two application programs supplied with the above computer system.
- ✓ **Norton Internet Security**
- ✓ **Microsoft Works (OEM)**
- ✓ **NTI CD-Maker Gold (OEM)**
- ✓ **Adobe Acrobat Reader 9**
- ✓ **Microsoft Office 2013 Home and Student Edition.**

INTRODUCTION TO ELEMENTARY PROGRAMING – For Only O'level

1) a) Define the terms below in relation to computer programming.

i) Program: **refers to a logically arranged set or list of instructions that direct a computer on what to do.**

ii) Bug: **is a coding error in a computer program.**

iii) Syntax: **are rules of programming languages that specify how words/symbols are put together.**

iv) Declaration: **tells the compiler the name and type of a variable you'll be using in your program.**

v) Flow chart: **is a diagrammatic representation of a program's algorithm using standard symbols and short statements to describe various activities.**

vi) Constant: **have values that are fixed for the duration of the program. E.g. Pi = 22/7.**

vii) Algorithm: **is a sequence of instructions written using special rules and statements which, if followed, produces a solution to the given problem.**

b) Broadly, programming language are categorized into two; **Low** Level Programming Language and **High** Level Programming Language. State;

i) **Two** examples of programming language in each category.

Examples of Low Level Programming Language
- ✓ **Machine code**
- ✓ **Assembly language**

Examples of High Level Programming Language
- ✓ **FORTRAN** (FORmula TRAnslator)
- ✓ **COBOL** (Common Business Oriented Language**)**
- ✓ **RPG** (Report Program Generator)
- ✓ **BASIC** (Beginner's All-purpose symbolic instruction code)
- ✓ **Pascal**
- ✓ **C**
- ✓ **C++**
- ✓ **Visual basic**

ii) **Two** merits and demerits of each category.

Low Level Programming Language	
Merits/Advantages	Demerits/Disadvantages
✓ **Very fast to execute because it is already in the language that the computer can understand.**	✓ **Easy to make mistakes in the sequence of 1s and 0s.**
✓ **Require little memory resources**	✓ **It is difficult to identify mistakes made.**
✓ **No need of language translator for machine language.**	✓ **Difficult to interpret by the programmer.**

High Level Programming Language	
Merits/Advantages	Demerits/Disadvantages
✓ **They are user friendly and easy to learn because they are near to natural language.**	✓ **They are executed much slower than low-level programming languages.**
✓ **High-level language programs are easy to debug.**	✓ **Require more memory than the low level languages.**
✓ **They are flexible hence they enhance the creativity of the programmer, increasing productivity.**	

2) a) What is a **Language Translator**?
   - ✓ **These are programming tools which change programs written in 2nd, 3rd, 4th, and 5th generation languages into machine codes (Os and 1s) which the computer can understand.**

   b) State and explain the **three** language translators used in programming.
   - ✓ **Assembler**: is a language translator that converts programs written in assembly language into machine code.
   - ✓ **Compiler**: is a language translator that converts the entire program written in high level language into machine code before the computer executes the program.
   - ✓ **Interpreter**: is a language translator that converts each high level language statement into machine code and executes immediately, statement by statement.

   c) Distinguish between a **Source Code** and **Object Code**.
   - ✓ Source code: **is a program code waiting to be translated by any language translator.**
     While
   - ✓ Object code: **is a program code in machine language that is ready for execution by the computer**.

3) a) Outline **three**;
   i) Importance of programming.
   - ✓ **Programming meets the increasing demand for computer programs.**
   - ✓ **Programming provides a better understanding of how computers work.**
   - ✓ **It helps develop thinking skills.**
   - ✓ **Computer programming is a well-paying job.**
   - ✓ **It is rewarding to see your ideas come out to life as a program.**

ii) Limitations of programming.
- ✓ **Limited knowledge of a programming language.**
- ✓ **Some programming languages are not user friendly.**
- ✓ **The difficulty to choose an appropriate programming language to use.**

b) State the factors to consider when choosing a programming language.
- ✓ **Ease of learning the language.**
- ✓ **Portability of the language.**
- ✓ **The level of expertise/skill of the programmer**
- ✓ **The ability of the program to interact with other existing programs.**
- ✓ **Availability of help facility to ensure correct coding. E.g. Type checking facility to minimize syntax errors.**

c) Outline **three** features of a good computer program.
- ✓ **Portability**: The program should have the ability to run on different platforms (operating systems) with or without minimal changes.
- ✓ **Readability**: The program should be written in such a way that it makes other programmers or users to follow the logic of the program without much effort.
- ✓ **Efficiency**: The program should be laid in such a manner that it fulfills its purpose without waste of resource (memory) and time.
- ✓ **Maintainability**: Maintenance of the software should be easy for any kind of user.
- ✓ **Flexibility**: Changes in the software should be easy to make.
- ✓ **Correctness**: The program should meet all the stated requirements.
- ✓ **Scalability**: The program should be very easy to upgrade it for more work (or for more number of users)
- ✓ **Interoperability**: The program should have the ability to exchange information with other applications and make use of information transparently.
- ✓ **Documentation**: The program should be documented for it to be easily understood by other programmers in the absence of the author.

4) a) Writing a computer program involves a series of steps/stages. Outline them.
- ✓ **Problem identification**
- ✓ **Program definition**
- ✓ **Program Design/algorithm**
- ✓ **Program Coding**
- ✓ **Program testing and debugging**
- ✓ **Program installation and maintenance**

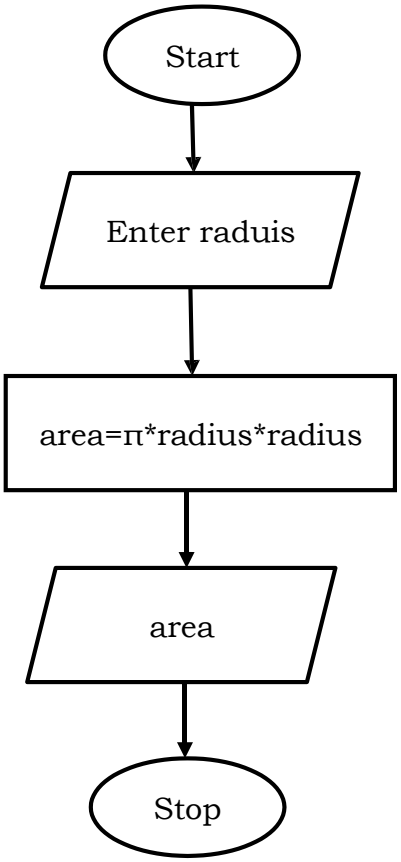
b) Using a programming language of your choice, provide source codes for a program that can return the Area of a Circle.

If we know the radius then we can calculate the area of a circle using formula: $A=\pi r^2$ (Here A is the area of the circle and r is radius).

```
#include<stdio.h>
int main ()
{
    float π, radius, area;
    printf ("Enter the value for the radius\n");
    scanf ("%f", &radius);
    π=3.14;
```

```
    area=π*radius*radius;
    printf ("The area of the Circle is:%.2f\n",area);
    return 0;
}
```

c) Draw a flow chart to represent the above program.



COMPUTER SECURITY, ICT ETHICAL ISSUES AND EMERGING TECHNOLOGIES

1) a) Define the term computer security risks.
   - ✓ **A computer security risk** is any event or action that could cause a loss or damage to computer hardware, software, data, or information.

   b) Outline any **four** examples of computer security risks.
   - ✓ **Computer viruses.**
   - ✓ **Unauthorized access and use of computer systems**
   - ✓ **Hardware theft and vandalism**
   - ✓ **Information theft**
   - ✓ **Software theft**
   - ✓ **System failure**

   c) For each of the above risks, give **one** measure that can be undertaken to avert/stop the risk.

Computer viruses
   - ✓ **The latest and updated version of Anti-Virus should be installed on the computer.**
   - ✓ **USB drives should be scanned for viruses before opening them.**

- ✓ **Junk or unknown emails should not be opened and must be deleted straightaway. Unauthorized or pirated software should not be installed on the computer.**
- ✓ **More secure operating systems such as LINUX, Ubuntu, Windows 10 etc. should be installed.**
- ✓ **Install security updates for your operating system and programs as soon as possible.**
- ✓ **If computers are connected to a network, firewall should be activated to block all unauthorized access by intruders with bad intensions to a network resources.**

Unauthorized access and use of computer systems

- ✓ **Keep the computer room closed when nobody is using it.**
- ✓ **Reinforce weak access points like doors and windows with metallic grills and burglar proofs.**
- ✓ **Enforce network security measures.**
- ✓ **Encrypt the data and information during transmission.**

Hardware theft and vandalism

- ✓ **Use physical access controls, such as locked doors, and windows.**
- ✓ **Use cables to lock the equipment to desk, cabinet, or floor.**
- ✓ **Install alarm systems for additional security.**
- ✓ **Install CCTV cameras.**
- ✓ **Use biometric devices.**
- ✓ **Burglar proof the computer room.**
- ✓ **Employ guards to keep watch over data and information centers and backups.**
- ✓ **Never leave a notebook computer or handheld computer unattended in a public place.**

Information theft

- ✓ **Implement access control to computers and networks like use of passwords.**
- ✓ **Use encryption techniques.**
- ✓ **Create backups in locations away from the main computing center.**
- ✓ **Reinforce weak access points like windows, doors and roofing.**
- ✓ **Employ guards to keep watch over data and information centers and backups.**

Software theft

- ✓ **Keep original software boxes and media in a secure location.**
- ✓ **Schedule regular software audits to guard against piracy.**
- ✓ **Set installation passwords that deter illegal installation of software.**
- ✓ **Use licenses and certificates to identify originals.**
- ✓ **Enact laws that protect the owners of data and information against piracy**
- ✓ **Make software cheap enough to increase affordability.**

System failure

- ✓ **Install surge protectors to protect computer equipment against voltage spikes.**
- ✓ **Regularly replace aging components before they completely stop working.**
- ✓ **Regularly update all software on the computer.**
- ✓ **Install lightening conductors or arresters to protect computer hardware from lightning strikes.**

2) a) Define the term **data backup**.

- ✓ Data Backup **is a duplicate of a file that can be used if the original is lost, damaged, or destroyed.**

b) Outline the **three** forms of data backup techniques.

- ✓ **Full back up:** copies all of the files in the computer.

- ✓ **Differential backup:** copies only the files that have changed since the last full backup.
- ✓ **Incremental backup:** copies only the files that have changed since the last full or last differential backup.

3) a) Outline **five** dangers as a result of continued computer use.
   - ✓ **Eye strain.**
   - ✓ **Headaches.**
   - ✓ **Neck pain due to poor sitting posture.**
   - ✓ **Back pain due to poor sitting posture.**
   - ✓ **Wrist pain to do over typing use of non-ergonomics keyboards.**
   - ✓ **Stress due to noise from fans, printers, power inputs.**
   - ✓ **Ear problems for use of ear phones.**

   b) Suggest possible ways of controlling dangers mentioned in (a) above.
   - ✓ **Pay attention to sitting posture to avoid back and neck pain**
   - ✓ **Take a break to stand up, walk around or stretch every to avoid back and neck pain.**
   - ✓ **Use ergonomics keyboards to avoid wrist pain.**
   - ✓ **Adjust the monitor brightness to reduce on the eye strain and headache**
   - ✓ **Place the display device about an arm's length away from the eyes with the top of the screen at eye level or below to reduce on the EMR that causes eye strain.**
   - ✓ **Adjust on the volume of audio or video playing device to avoid ear problems.**

4) a) Define the term **computer ethics**.
   - ✓ **Computer ethics are the moral guidelines that govern the use of computers and information systems.**

   b) Mention **three** netiquette guidelines/code of conduct for computer users.
   - ✓ **Computers may not be used to harm other people.**
   - ✓ **Users may not interfere with other's computer work.**
   - ✓ **Computers may not be used to steal.**
   - ✓ **Computers may not be used to bear false witness.**

   c) State **three** unethical practices by computer user.
   - ✓ **Using a computer to harm other people.**
   - ✓ **Interfering with other's computer work.**
   - ✓ **Using a computer to steal.**
   - ✓ **Using a computer to bear false witness.**

5) a) Write short notes on the following terms.
   i) Intellectual property: **refers to work created by inventors, authors, and artists. It can be a song, book, artistic work etc**.
   ii) Patent: **is a right, granted by the government, to exclude others from making, using, or selling your intellectual property.**
   iii) Copyright: **gives authors and artists exclusive rights to duplicate, publish, and sell their intellectual property.**
   iv) Trademark: **protects a company's logos and brand names.**

b) Why do you think there is need to enforce the copyright law in Uganda?
   - ✓ **To protect users against fake computer products.**
   - ✓ **To Grant ownership.**
   - ✓ **To prohibit unfair profiting from other people's work/efforts.**
   - ✓ **To encourage authorship.**

- ✓ **To encourage creativity through ensuring that creative people receive the financial benefits of their work.**
- ✓ **To allow payment of damages to the copyright owner.**

6) a) Define the term **artificial intelligence**.
   - ✓ Artificial Intelligence **refers to the art and science of creating computer systems that simulate human thought and behavior.**

   b) Explain **five** areas where Artificial intelligence is applied.
   - ✓ **Robotics:** involves developing mechanical or computer devices to perform tasks that require a high degree of precision or are tedious or hazardous for humans.
   - ✓ **Computer Vision:** combines hardware (cameras and scanners) and AI software that permit computers to capture, store, and interpret visual images and pictures.
   - ✓ **Natural Language Processing:** uses AI techniques to enable computers to generate and understand natural human languages, such as English.
   - ✓ **Pattern recognition:** is an area of AI that develops systems that are trained to recognize patterns in data.
   - ✓ **Intelligent Agent:** consists of programs and a knowledge base used to perform a specific task for a person, a process, or another program.
   - ✓ **Artificial Creativity:** is a branch of AI that works to program computers to express themselves through art, music, poetry, and other outlets.

7) a) Define the following terms as used in system analysis and design.
   - ✓ System: **is a collection of elements or components that are organized for a common purpose.**
   - ✓ Systems Analysis: **is a process of collecting and interpreting facts, identifying the problems of a system so as that it meets its objectives.**
   - ✓ Systems Design: **is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements.**
   - ✓ System Analysis and Design: **is an active field in which analysts repetitively learn new approaches and different techniques for building the system more effectively and efficiently.**
   - ✓ Systems Development Life Cycle: **is a conceptual model which includes policies and procedures for developing or altering systems throughout their life cycles.**

   b) State and explain the stages or phases of the Systems Development Life Cycle.
   - ✓ **Planning or Feasibility Study:** define the problem and scope of existing system.
   - ✓ **Analysis and Specification:** Gather, analyze, and validate the information.
   - ✓ **System Design:** Includes the design of application, network, databases and user interfaces.
   - ✓ **Implementation:** Implement the design into source code through coding.
   - ✓ **Maintenance/Support**: Implement the changes that software might undergo over a period of time, or implement any new requirements after the software is deployed at the customer location.

   c) Who is a system analyst?
   - ✓ A system analyst **is a person who is thoroughly aware of the system and guides the system development project by giving proper directions.**

8) a) Identify **five** ICT related employment opportunities in Uganda today.
   - ✓ **Computer training**
   - ✓ **Computer servicing and repair**
   - ✓ **Network administering**
   - ✓ **Photocopying and typesetting**
   - ✓ **Computer programming**

- ✓ **Computer laboratory attending**
- ✓ **Computer software installation**
- ✓ **CD/DVD writing and selling**
- ✓ **Desktop publishing**
- ✓ **Social media marketing**
- ✓ **Computer vending or dealing**
- ✓ **Video editing**
- ✓ **Digital money transfer dealing**

b) List **three** professional careers in the ICT Industry.

- ✓ **Webmasters / Web developers**
- ✓ **Technical writers**
- ✓ **Computer Trainers**
- ✓ **Software engineers**
- ✓ **System administrators**
- ✓ **Network administrator**
- ✓ **Computer support specialists**
- ✓ **Database administrators**
- ✓ **Computer technicians**
- ✓ **Computer programmers**
- ✓ **Data entrants**
- ✓ **Graphic designers**

c) State the role (s) of each member in the ICT Industry.

- ✓ Webmasters / Web developers: **design, develop and maintain web sites and web systems.**
- ✓ Computer Trainers: **teach new users how to use the computer software and hardware.**
- ✓ System administrators: **responsible for the upkeep, configuration, and reliable operation of computer systems; especially multi-user computers, such as servers.**
- ✓ Computer support specialists: **provide technical help/advice to customers and other users.**
- ✓ Computer technicians: **repair and install computer components and systems.**
- ✓ Data entrants: **enter customer information, lists, and other type of data into computer systems.**
- ✓ Technical writers: **prepare instructional manuals, technical reports, and other scientific or technical documents.**
- ✓ Network administrators: **responsible for the design, implementation and maintenance of networks.**
- ✓ Database administrators: **use database management software to determine the most efficient ways to organize and access a company's data.**
- ✓ Computer programmers: **create, test, and troubleshoot programs used by computers.**
- ✓ Graphic designers: **create visual concepts, using computer software, to communicate ideas that inspire, inform, or captivate consumers. They develop the overall layout and production design for advertisements, brochures, magazines, and corporate reports.**

COMPUTER WORD PROCESSING

1) a) Define the following terms as used in computer word processing.

i) Word processor: **is an application program that enables the user to create, edit, format, save and print text documents.**

ii) Word processing: **is the act of using a word processor.**

b) List **four** examples of word processors.
- ✓ **Microsoft word**
- ✓ **Word perfect**
- ✓ **Lotus word pro**
- ✓ **Apple pages**
- ✓ **Word pad**
- ✓ **Microsoft works**
- ✓ **Apple works**
- ✓ **Windows Write**
- ✓ **Word pad.**
- ✓ **Openoffice.org**

c) Mention **four** examples of documents created using word processors.
- ✓ **Letters**
- ✓ **Memos**
- ✓ **Mailing lists**
- ✓ **Resumes**
- ✓ **Minutes**
- ✓ **Agendas**

d) Give any **four** merits of using electronic processors over ordinary type writers.
- ✓ **Typing using word processor is easier and faster because some actions are automated e.g. word wrap.**
- ✓ **Word processor has editing tools such as spell and grammar check hence no mistakes.**
- ✓ **Word processor produces neat and attractive work.**
- ✓ **Word processor has formatting features to make the document look more attractive and readable**
- ✓ **With Word processor many copies can be printed per session.**
- ✓ **Convenient to create form letters and mailing labels.**

e) State **four** applications of word processors.
- ✓ **Used to type reports and business proposals.**
- ✓ **Used in schools to type exam.**
- ✓ **Used by students to type essays.**
- ✓ **Used by students to create work for research and publication.**
- ✓ **Used by individuals to type resumes.**

2) a) Outline **four** basic features of word processors.
- ✓ **Insert text**
- ✓ **Cut and paste**
- ✓ **Word wrap**
- ✓ **Delete text**
- ✓ **Find and replace**
- ✓ **Mail merge**

b) Distinguish between **editing** a document and **formatting** a document.
- ✓ Editing a document **refers to making necessary changes to an existing document** while Formatting a document **refers to the art of making the text document look appealing and attractive to the user.**

c) Outline **four** electronic word processor features used when;

i) Editing a document.
- ✓ **Thesaurus:** is an editing tool that helps the user find words or phrases with similar or opposite meaning.
- ✓ **Find and replace:** is the feature that allows you to direct the word processor to search for a particular word or phrase and then direct it still to replace the found word or phrase with another word everywhere it appears in your document.
- ✓ **Autocorrect:** is the feature that automatically detects and fixes the transposed letters of a word or capitalized words.
- ✓ **Auto complete:** is the feature that displays a complete word when the user types first few characters of the word.
- ✓ **Spelling and grammar:** is the feature that checks on the spelling and grammar of the text in the document.
- ✓ **Delete:** is used to erase the selected text.
- ✓ **Cut:** enables you to completely move the selected text to a new location using the paste option.
- ✓ **Copy:** enables you to duplicate the selected text to new location leaving the original file or folder
- ✓ **Paste:** enables you to transfer the cut or copied content from the clipboard to a new location.

ii) Formatting a document.
- ✓ **Text alignment**
- ✓ **Footnote**
- ✓ **Endnote**
- ✓ **Footer**
- ✓ **Drop cap**
- ✓ **Indention**
- ✓ **Character spacing**
- ✓ **Line spacing**
- ✓ **Page orientation**
- ✓ **Bullets and numbering**
- ✓ **Borders and shading**
- ✓ **Change case**
- ✓ **Mail merging**
- ✓ **Word count**

3) Write short notes on the following features.

i) Text alignment: **determines the position of the text with in a document relative to the edge of the margin.**
ii) Footnote: **are words found at the bottom of the page. They are normally used for detailed comments.**
iii) Endnote: **are words found at the end of a complete document. They are normally used for citation of sources.**
iv) Footer: **are standard words that appear at the bottom margin of a page.**
v) Header: **are standard words that appear at the top margin of page**.
vi) Drop cap: **makes the first letter that begin sentence large.**
vii) Indention: **refers to moving line of text away from the margin.**
viii) Line spacing: **refers to the vertical gap between lines of text.**
ix) Character spacing: **refers to the gap or space between the characters in the text or a word**.
x) Word count: **counts the number of words, characters, paragraphs and lines in the document.**
xi) Page orientation: **refers to the positioning of the page in relation to the text.**
xii) Margins: **is a gap away from the edge of the page.**
xiii) Word wrap: **is a feature that forces all text to be confined within the defined margins.**
xiv) Clip board: **is a temporary storage location where items which are copied or cut in a document are held before they are pasted to another location in a document.**
xv) Mail merging: **refers to the process where data from one document is pulled into another document.**

4) a) Distinguish between **Save** and **Save As**.
   - ✓ Save**, allows the user to save a new document and give it a file name or to save the changes made after editing or formatting your document that's already stored onto your storage medium** while Save As**, allows the user to save the existing document with a new file name especially after making some changes. Save As leaves the original file unchanged.**

   b) Under what circumstance may a user use the Save As option?
   - ✓ **When you want to create a new document based on the one you have already got open.**
   - ✓ **When you want to change the name of the file.**
   - ✓ **When you want to change the location of the file.**

5) Define the following terms as used in tables.
   i) Merging: **means combining more than one cell in the table.**
   ii) Splitting: **means subdividing a cell or cells into more cells**.
   iii) Sorting: **means to arrange data in columns according to a particular order**.

ELECTRONIC SPREADSHEETS

1) a) Define an **Electronic Spreadsheet**.
   - ✓ An electronic spreadsheet **is an application program made up of rows and columns used to carry out calculation and data analysis.**

   b) Outline **four** examples of spreadsheet programs.
   - ✓ **Microsoft Excel**
   - ✓ **Open Office Calc**
   - ✓ **VisiCalc**
   - ✓ **VP-Planner**
   - ✓ **Lotus 1-2-3**
   - ✓ **Multiplan**

   c) Give **four** applications/uses of spreadsheet programs.
   - ✓ **Budget forecasts.**
   - ✓ **Financial accounting.**
   - ✓ **Results preparation.**
   - ✓ **Graphical analysis.**
   - ✓ **Inventory management.**

   d) State **four** features of spreadsheet programs.
   - ✓ **Graphs**
   - ✓ **Cell locking**
   - ✓ **Cell formatting**
   - ✓ **Cell merging**
   - ✓ **Header and footer**
   - ✓ **Cut and paste**
   - ✓ **Data sort**
   - ✓ **Wrap text**
   - ✓ **Zooming worksheet**

2) a) List the **four** major entries (cell contents) made in spreadsheets.
   - ✓ **Values**
   - ✓ **Formulas**
   - ✓ **Labels**
   - ✓ **Functions**

   b) Outline the **three** major components of spreadsheet programs.
   - ✓ **Worksheet**
   - ✓ **Database**
   - ✓ **Graph (Chart)**

3) a) Give **four** types of graphs/charts created in spreadsheets.
   - ✓ **Pie charts**
   - ✓ **Bar Graphs**
   - ✓ **Line graphs**
   - ✓ **Column graphs**

   b) Outline **three** characteristics of a good graph/chart.
   - ✓ **It should have a title**
   - ✓ **It should have well labeled axes**
   - ✓ **It should have data labels and legends moved in appropriate position.**

   c) State **three** data types used in spreadsheet programs.
   - ✓ **Number**
   - ✓ **Short date**
   - ✓ **Text**
   - ✓ **Percentage**
   - ✓ **Time**

4) Define the following terms as used in spreadsheets.
   i) Row: **refers to the horizontal arrangement of cells.**
   ii) Column: **refers to the vertical arrangement of cells.**
   iii) Cell: **is the intersection of a row and a column.**
   iv) Active cell: **is the cell in which the cursor is currently located**
   v) Calculated cell: **is a cell that contains a calculation but displays the result of that calculation.**
   iv) Cell merging: **means taking two or more cells and constructing a single cell out of them.**
   v) Formula bar: **is a rectangular text box where formula, text, or numbers typed in a cell are displayed.**
   vi) Wrap text: **automatically keeps the same font size but places the text on a separate line.**
   vii) Shrink to fit: **automatically reduces the text font size to keep everything in the same cell or on the same line.**
   vi) Range: **is a group of adjacent cells.**

5) a) Distinguish between the terms below.
   i) Formulae and function: a formula **is a user defined expression used to carry out calculations and return results. E.g. =B3+C6** while a function **is a predefined (inbuilt) expressions used to carry out calculations and return results. E.g. =SUM (B3:B6).**
   ii) Name box and cell address: Name box **displays the cell address of the active cell** while a Cell address **is the number in the name box.**

iii) Operator and operand: an operator **is symbol that specifies the type of calculation you want to perform on the arguments of a formula** while an operand **is a quantity upon which a mathematical operation is performed. E.g. 2*3, 2 and 3 are operands, * is an operator.**

b) Outline **three**;

i) Statistical operators used in spreadsheets.
- ✓ **MAX**
- ✓ **COUNTA**
- ✓ **AVERAGE**
- ✓ **MIN**
- ✓ **COUNTIF**
- ✓ **COUNTBLANK**
- ✓ **COUNT**
- ✓ **RANK**

ii) Arithmetic operators used in spreadsheets.
- ✓ **SUM**
- ✓ **SUMIF**
- ✓ **SUMIFS**

iii) Logical functions used in spreadsheet.
- ✓ **IF**
- ✓ **AND**
- ✓ **OR**

6) The table below shows a worksheet which Robert was working on. Use it to answer the questions that follow.

Sheet1 | Sheet2 | Sheet3 | ...

	A	B	C	D
1	ST.LAWRENECE ACADEMY, SCHOOLS AND COLLEGES			
2	Index No	Name	Fees Paid	Fees Balance
3	SLASC/001	James Ubany Waya	700,000	#DIV/0!
4	SLASC/002	Daniella Natulinda	########	
5	SLASC/003	Albert Nondo	450,000	
6	Total		#NAME?	
7				
8	Actual fee paid			900,000
9				

i) Suggest a reason why the entry in cell **C4** appeared as shown.
- ✓ **The column width was not wide enough to accommodate the entered value.**

ii) How do you rectify the error in cell **C4**?
- ✓ **Widen the column width.**
- ✓ **Reduce on the font size of the entered value.**
- ✓ **You can also use the Auto fit feature.**

iii) What does the error in cell **D3** mean?
- ✓ **It means that the user attempted to divide the number in that cell by zero which is mathematically wrong.**

iv) What does the error in cell **C6** mean?
- ✓ **It means that the user typed the function name wrongly.**

v) How do you correct the error in cell **C6**?
- ✓ **By typing the correct function name.**

vi) Write formula you would use to computer the fees balance. **Use absolute cell reference.**
- ✓ **=$D$8-C3**

7) Define the following referencing types with examples.
   i) Relative cell referencing: **is a cell reference in which the formula changes when copied to another cell. E.g. =B2+C2.**
   ii) Absolute cell referencing**: is a cell reference in which the formula does NOT change when copied to another cell. E.g. =$D$8-C3.**
   iii) Mixed cell referencing: **is a cell reference with both relative and absolute part.**

PRESENTATION SOFTWARE

1) a) Define the terms below in relation to computer presentation.
   i) Electronic presentation: **is a computer software package used to display information, normally in the form of a slide show.**
   ii) Multimedia: **refers to use of computer program to integrate text, graphics, audio, sound and video into a single file or medium of communication.**

   b) Excluding Microsoft Power Point, list **three** examples of presentation software.
   - ✓ **Presentista**
   - ✓ **Custom show**
   - ✓ **Corel presentation**
   - ✓ **Prezi**
   - ✓ **Apple keynote**
   - ✓ **Impress**
   - ✓ **Havard graphics presentation**

   c) Give **three** uses or application areas for presentation software.
   - ✓ **Teaching and learning.**
   - ✓ **Entertainment.**
   - ✓ **Promotional slides.**
   - ✓ **Publishing like web designing.**

   d) Outline **three** features/characteristics of good presentation.
   - ✓ **Each slide should have a heading.**
   - ✓ **Make use of appropriate colors and fonts.**
   - ✓ **The information should be brief and clear.**
   - ✓ **It should have few but relevant graphics/images.**
   - ✓ **It should not have color clashes.**
   - ✓ **The layouts used should be appropriate.**
   - ✓ **The animations and transitions used should be uniform and not distracting.**

2) a) Define the following effects as applied in electronic presentation.
   i) Transition: are the visual movements as one slide changes to another.
   ii) Animation: are visual effects applied to individual items on the slide**.**

   b) State **two** uses of the above effects.
   - ✓ **They hold the attention of the audience.**

- ✓ **Animations control what is on the slide at any given time.**
- ✓ **Animations provide emphasis when making a point.**

3) Write short notes on the following terms used in presentation software.
   i) Slide: **is a work area where text and graphics are entered.**
   ii) Slide layout: **is the given design of a slide showing divisions/areas or sections of a slide where work can be done.**
   iii) Place holder: **are boxes with dotted borders that hold content and reside within a slide layout.**
   iv) Action button: **is a feature under presentation software that links you to various slides in a presentation with a lot of ease.**
   v) Hyperlink: **is a connection from a slide to another slide, a web page or a file.**
   vi) Master slide: **is a single slide that controls all other slides in a given presentation.**

4) Write short notes on the following views used in presentation software.
   i) Normal view: **is more commonly known and used view while creating a PowerPoint presentation.**
   ii) Outline view: **shows all the text of all slides in a list on the left of the PowerPoint screen. No graphics are shown in Outline view but text.**
   iii) Slide sorter view: **displays all slides at once in thumbnail form. It makes it easier to sort, delete and quickly view slides.**
   iv) Notes pages view: **shows a smaller version of the slide with an area below for printed notes.**
   v) Slide show view: **is used when presenting to an audience. It enables one to have a full screen view of slides one after the other.**

5) Distinguish between **Slide Mode Printing** and **Handout Mode Printing**.
   - ✓ Slide mode printing **involves printing each slide on its separate page** while Handout mode printing **lets you print your desired number of slides on one page.**

DATABASES

1) a) Define a;
   i) Database: **is an organized collection of related data.**
   ii) Database Management System (DBMS)**: is the application software used for managing data stored in databases.**

b) Outline **four** examples of Database Management Systems.
- ✓ **Microsoft Access**
- ✓ **Corel paradox**
- ✓ **Oracle**
- ✓ **DBIII**
- ✓ **Sybase**
- ✓ **DBIV**
- ✓ **SQL server**
- ✓ **Clipper**
- ✓ **Informix**
- ✓ **Microsoft Fox Pro**
- ✓ **Lotus approach**

c) State **four** functions of Database Management Systems.

- ✓ **Allows automatic update of records**
- ✓ **Provides data backup and recovery services**
- ✓ **Organizes data for easy access.**
- ✓ **Allows users to add or delete records.**
- ✓ **Acts as an interface to other applications.**
- ✓ **Allows modifying of existing records.**
- ✓ **Keeps statistics of data items in a database.**

d) Give **four** advantages of using Database Management System over manual databases.

- ✓ **Little space is required to store the database**
- ✓ **Sorting and updating data can easily be done with Database Management System**
- ✓ **There are fewer updating errors since the data is centralized**
- ✓ **There is cost reduction on data entry and storage**
- ✓ **It's easier to limit access to the database since security is centralized**

2) Give the function (s) of the database objects.

i) Table

- ✓ **It is used to store data.**
- ✓ **It is also used to sort the data in the order of your choice.**

ii) Form

- ✓ **It is used to enter data and navigate data into the table.**
- ✓ **It is also used for calculation.**

iii) Query

- ✓ **It is used to find particular information from a table.**
- ✓ **It is used to search on several fields**
- ✓ **It is used to sort the results in the order of your choice.**
- ✓ **It is used for to perform calculations on the data.**

iv) Report

- ✓ **Gives a summary of information designed for a printout.**

3) a) Define a **Data type**.

- ✓ A data type **specifies the way specific data items are to be stored. Or**
- ✓ **It defines what kind of values to be entered in a field.**

b) Under what circumstances will the following data types be used?

i) Text: **when the data to be entered under that field is made up of alphabets or numbers or alphanumeric or symbols not exceeding 255 characters.**

ii) Memo: **when the data to be entered under that field is made up of alphabets or numbers or alphanumeric or symbols exceeding 255 characters.**

iii) Number: **when the data to be entered under that field is made up of only numbers but without a zero at the start**.

iv) Auto Number: **when there is a uniform increment in the data as you move down the table.**

v) Date/time: **when the data to be entered under that field is made up of either date or time values.**

vi) Currency: **when the data to be entered under that field is made up of money values.**

vii) Yes/No: **when the data to be entered under that field is made up of either Yes or No**.

4) a) Distinguish between;

i) Text and Memo data types: Text data type **is used on fields where the field size of data entered is less or equal to 255 characters** while Memo data type **is used on fields where the field size of data entered is above 255 characters.**

ii) Relational database and flat file database: a relational database **is a database with more than one table** while a flat file database **is a database with one table**.

iii) Microsoft Access and a database: Microsoft Access **is an application program used to create and manage databases** while a database **is an organized collection of related data.**

iv) Validation rule and validation text: a validation rule **is a logic expression that restricts entries in the field** while validation text **is the message that appears when the validation rule is violated.**

b) Write short notes on the following database concepts.

i) Referential integrity: **is a database concept that ensures that relationships between tables remain consistent.**

ii) Entity integrity**: is an integrity rule which states that every table must have a primary key and that the column or columns chosen to be the primary key should be unique and not NULL.**

iii) Primary key**: is a key field that uniquely identifies each record in the table.**

iv) Filed size: **is the number of characters to be entered in a field.**

c) Outline **three** validation checks made in database.

- ✓ **Data type check**
- ✓ **Primary key check**
- ✓ **Field size**
- ✓ **Validation rule**

5) The table below was extracted from a database of Makerere High School Migadde. Use it to answer the questions that follow.

CANDIDATES TABLE

Employee No	First Name	Last Name	Membership No	DOB	MEMBERSHIP FEE (Shs)	Fully Paid	AGE	Click to Add
1	Agaba	Lucky	456	11/12/1990	200,000	☑		
2	Nakkazzi	Sharifah	876	01/10/2015	50,000	☐		
3	Ojede	Isaac	908	08/08/2003	12,000	☐		
4	Mugabi	Benjamin	453	01/12/1999	10,000	☐		
5	Ebil	Calvin	234	03/10/2014	70,000	☐		
6	Kabasinguzi	Gloria	123	12/12/2010	100,000	☑		
7	Ahimbisibwe	Calorine	879	14/01/2013	140,000	☑		
8	Nakkazzi	Esther	657	03/11/1992	600,000	☐		
(New)						☐		

a) Identify the;

i) Table name. **CANDIDATES TABLE**

ii) Key field in the table. **Employee No**

iii) Number of records in the table. **8 records**

iv) Number of fields in the table. **8 fields**

v) The sixth field name. **MEMBERSHIP FEE (Shs)**

b) State the most appropriate data type for;

i) Employee No: **Auto Number**

ii) Last Name: **Text**

iii) Membership No: **Number**

iv) DOB: **Date/Time**
v) Membership Fee: **Currency**
vi) Fully Paid: **Yes/No**
vii) Age: **Number**

c) Write full descriptions for;
i) Employee No: **Employee Number**
ii) Membership No: **Membership Number**
iii) DOB: **Date of Birth**

d) Write the criteria or criterion to be used in the query design view to return;
i) Candidates first name starting with letters "**Nakk**".
✓ **Like "nakk*"**
ii) Candidate born between **1990** and **2003**.
✓ **Between #31/12/1990# And #01/01/2003#**
iii) Candidates with Membership No **below or equal 400**.
✓ **<=400**
iv) Candidate (s) with Last Name ending with "**ine**" and "**ria**" that paid fully.
✓ **Type: Like "*ine" Or Like "*ria" (Under Last Name field) and also type: Yes (Under the Fully Paid field)**
v) Candidates' **AGE**.
✓ **AGE: DateDiff("yyyy",[DOB],Now())**

DESKTOP PUBLISHING – For Only A 'level

1) a) Define the term **Desktop publishing Software** (DTP).
✓ Desktop publishing: **is the process of using a computer and specific types of software to combine text, images and artwork to produce documents properly formatted for print or visual consumption.**
✓ Desktop publishing: **can also be defined as the creation of documents using page layouts skills on a personal computer.**
✓ Electronic publishing: **is the process of creating stylish print documents that contain text graphics and a mixture of colors.**

b) State **three** features of Desktop publishing Software.
✓ **Word Art**
✓ **Italic Font**
✓ **Font size**
✓ **ClipArt**
✓ **Font styles**
✓ **Bold Font**
✓ **Centre text**

c) Give **three** examples of Desktop publishing Software.
✓ **Adobe illustrator**
✓ **Microsoft Office Publisher**
✓ **Print Master**
✓ **Coral Draw**
✓ **Adobe InDesign**
✓ **Adobe PageMaker**

d) Outline **three** publications created using Desktop publishing Software.
- ✓ **Brochure**
- ✓ **Calendars**
- ✓ **Banners**
- ✓ **Cards**
- ✓ **Posters**
- ✓ **Webpage**
- ✓ **Certificates**
- ✓ **Flyers**
- ✓ **Newsletter**

e) What is meant by?

i) Crop mark: **also known as trim marks, are lines printed in the corners of publication's sheet or sheets of paper to show the printer where to trim the paper.**

ii) Frame: **A feature that enables a user to fit in the required text or image of the required dimension.**

iii) Template: **This is a tool having a pre-formatted design styles that can be used in publication to help a user easily create basic publication.**

WEB DESIGN – For Only O'level

1) Define the terms below.

i) Web Design: **is the process of planning and creating a website.**

ii) Web design software: **is a computer program used to create, edit, and update web pages and websites.**

iii) Web page: **is a document on the World Wide Web that is created using HTML.**

iv) Website: **refers to a collection of related web pages.**

v) Home page: **is the first page of a website.**

vi) Web publishing: **is the process of publishing original content on the internet.**

vii) Hosting: **is a service that allows organizations and individuals to post a website or web page onto the Internet.**

2) a) Outline **three** web designing software.
- ✓ **HTML Editor**
- ✓ **Ultra Edit**
- ✓ **Web studio 5.0**
- ✓ **Adobe Dreamweaver**
- ✓ **Serif web plus**
- ✓ **Web easy professional**

b) Give **four** characteristics of a good website.
- ✓ **The background color should not mask the font color as this facilitates easy reading of website content.**
- ✓ **It should be easy to navigate. This can be done by use of hyperlinks.**
- ✓ **Files on the site to be downloaded should not be too heavy and should not have too much graphics, sound and movies as these will render it slow.**
- ✓ **It should have working links.**
- ✓ **It should have updated content.**
- ✓ **The website content should be clear and precise.**

c) State **four** importance of websites.

- ✓ **Provide motivation/ reward for students**: posting the students' excellent work on the website is a great way to praise them and their works.
- ✓ **Keep parents well-informed:** everything parents need to know is available on an effective website – activities, recognitions, announcements, etc.
- ✓ **Communication:** the school can reach out to a wider audience worldwide like students recruitment.
- ✓ **Provide educational support:** students can get tutorial lessons through podcast and other useful materials.
- ✓ **Teacher collaboration:** it can provide a forum for teachers to collaborate with other teachers worldwide as a community of practice.
- ✓ **Collaboration and networking:** it can provide a forum for students and teachers to collaborate with the outside world.
- ✓ **Advertisement:** it can provide general information about the school.
- ✓ **Publishing:** it can enable both students and teachers publish their work.

d) Explain **three** threats of using websites in organizations.

- ✓ **Reliability:** the information on your website might be unreliable if not updated on a regular basis.
- ✓ **Difficultly reaching the right people:** it is difficult to reach the right target audience with websites because of the nature of the internet.
- ✓ **Spam:** by having a contact form or your email address published on your website, you'll find your inbox filling up with spam emails.

3) Give the functions of the following tags as used in web design.

- ✓ <html>: **HTML tag contain HTML elements, and give a command to browser to read the document as an HTML document.**
- ✓ <title>: **TITLE tag defines the title of the document.**
- ✓ <head>: **Head tag defines general information about the document, page title, meta-tags, scripts and links to follow, and other commands to browser.**
- ✓ <body>: **BODY tag defines the content of the web page.**
- ✓ <font>: **FONT tag attributes text.**
- ✓ <table>: **TABLE tag defines a table.**
- ✓ <form>: **Form tag defines a form.**

NOTE

Endeavor to read this handout before you sit mocks and final UCE & UACE Exams.

Good luck

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