I.C.T. HAND BOOK 2020
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This booklet covers the entire advance Level Information Technology Syllabus. There has been a demand for a corresponding of ICT summarized resource that makes a student understand the intention of learning ICT.

The booklet has been designed for students who are preparing to sit for their course work, assessments and **UNEB** final examinations. The material used in this booklet has been well researched on and edited by the author. The sources included: -the internet, textbooks, handouts, past papers and discussions conducted by ICT Scholars

What is a computer?

A computer is a general purpose machine which can receive data, store and manipulate (process) it and output information.

OR

It is an electronic machine which allows/accepts data input, process it under special instruction, stores, and outputs information

Characteristics of a modern computer
Speed: Computers are very fast in their operations. Their speed is measured in MIPs
Accuracy: Computers hardly make mistakes. Mistakes committed by computers are mainly caused by the user. Hence the saying garbage in garbage out (GIGO). GIGO
Storage: Computers keep user data / information for future use.
Diligence: Computers work on the same task over and over without getting bored or tired
Artificial intelligence: computers accept instructions and respond accordingly.
Automation: Computers have the ability of working without human supervision.
Versatility: Computers have the ability of doing different/ multiple tasks.
Communication: Networked computers have the ability to send and receive messages.
Adaptability. Ability of computer to comply with different settings. For example, they can be used for home use, banking, communication, entertainment, space explorations, teaching

Factors that should be considered when purchasing a computer
→Hard disk capacity
→Processor speed and type

→RAM capacity

→State of a computer (whether new or old)

→Computer size (Whether it's a desktop or laptop)

→Technology used to make the monitor and its size (CRT or LCD) **The table below gives specification details of two computers A and B.**

Component	Computer A	Computer B
OS	Windows XP	Ubuntu
HDD	10GB	4096MBs
CPU	2.4GHz	526MHz
Network Type	Cable-NIC	WIFI
System Type	32 bits OS	64 BIT OS
Display	HD-LCD	CRT
RAM	1024MBs	1GB

i.   Which one of the above computer would you recommend for your personal friend to buy?.. **B, because it has 64 bits OS word length**

ii.   Which computer type is good for multi-colour out   **A because of 64 bits OS**

iii. Which computer type is fast   **A because it has 2.4 Ghz processor speed**

 v. Which computer type is good for UTP networking media?

.**A because it has a NIC that supports use of cables that minimize environmental obstacles like wind or rain.**

Which computer type is not disturbed by viruses?

B.. because of Ubuntu which is virus resistant

Which computer type has the smallest hard disk space?..**.....B……**

THE CONCEPT OF INFORMATION PROCESSING
Define the term information processing.

→Process of transferring data into a form which can be used to make better decision.

→The act of changing/converting data into more meaning format /information

The difference between data and information.

Data are raw facts entered into a computer while information is processed facts/data.

List one example of information.

Pay slips, report cards, invoices, executive summary

Describe the stages in the information processing cycle.

→**Data collection, preparation and verifications**
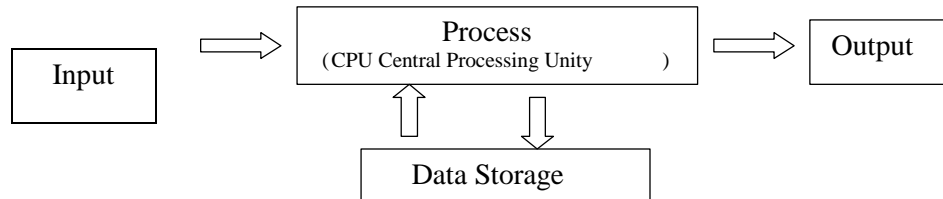
→Finding data from its sources,

recording it on some media & organizing it in some order suitable for input

→ **Inputting**: entering data into the computer

→**Processing:** Manipulation/converting of data to get information

→**Outputting:** presentation of information to the user

→**Storage:** keeping of data temporary on RAM or in permanent format for future reference.

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                    ┌─────────────────────────────────┐
                    │           Process               │
┌──────────┐        │ (CPU Central Processing Unity )  │       ┌──────────┐
│  Input   │ ══════▷│                                 │ ══════▷│  Output  │
└──────────┘        └─────────────────────────────────┘       └──────────┘
                           ⇧          ⇩
                    ┌─────────────────────────┐
                    │      Data Storage       │
                    └─────────────────────────┘
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Terminologies'

Computer engineer- A person who designs and develops computer components

Computer operator- A person who enters data in the computer for processing

Computer technician- The person responsible for assembling electronic equipment.

→Does the repair and maintenance of computer equipment

→Upgrade software in computer systems

Computer instructor- The person responsible for training people on how to use computers and various application programs

→Guides learners during research and advising them on best career opportunities

Systems administrator-The person who designs, sets up and maintains a computer network →Monitors the use of network resources

→Trouble shoots network problems

Database administrator- Creates, tests and maintains a database

→Updates records in some information systems

Programmer- Develops and maintains software programs

→Develops and customizes software programs for large organization

Information communication technology.

→This is all types of equipment and programs used in processing information.

→The technology that handles information as well as aiding communication.

→The procedures and equipment used by people to improve the quality of gathering, processing, communicating and storing information.

Communication: The transmitting of a message from one point to another or a sender to a receiver through several (physical or electronic) media.

Technology: The advanced scientific knowledge that eases work.

<u>How Information Communication Technology can be applied in schools.</u>

→As teaching aid e.g. simulation of laboratory experiments.

→Virtual Library where students can access books online.

→Online research through use of Google scholar and other sites

→Student end of term report card generation

→Through online education

→Computer Assisted Assessment where teachers use computers to examine students.

→Through Computer aided learning where students do courses online.

→School record keeping

→Use of software like word processors, spreadsheets which enable us to accomplish projects and other school activities

→Access to the internet and thousands of online databases

→The use interactive teaching packages available on CD for many different subjects

→Links with other schools or colleges for better knowledge sharing

→Students can work at their own pace, repeating sections they don't understand with the use of electronic materials

→Students can learn by themselves even when the teacher is away because the notes and other materials can be left online

→Immediate results or feedback is given when a question is answered the case of CAA

→There is rich educational resources on CD-ROMs and internet making textbooks cheaper

→The materials are presented in a consistent way; you are not dependent on the skills of a particular senior teacher.

→Few teachers may be required once learning using ICT has been instituted

Ways how Information Communication Technology can be of negative impact to your school.

→ Moral degradation through access of pornographic sites

→Eye strains in students due to prolonged usage.

→Consume a lot of power which is costly for schools.

→Maintenance and repair are expensive.

→Computer virus attacks lead to loss of data.

→Computers facilitate forgery of documents which cost organizations money.

→Computers put students and teachers' privacy at risk due to the likelihood of hacking.

Ways how I T is used at home to enhance learning.

→Pay bills through the payment by phone services (PPS)

→Manage investments and family budgets related to education.

→Listen to educative music

→Watch educative movies and videos

→Play educative games

→Research and education

→Take college classes online (i.e., cyber classes)

→Produce assignment and reports

→Learn to speak a foreign language

→Help youngsters to read, write, count and spell

→Personal and business communications

→Organize names and addresses of academic friends

→Communicate with others around the world using e-mail and chat rooms Internet access

→Access a wealth of information such as news, stock prices, and educational materials

→Shop for goods and services

→Communicate and exchange information with other people around the world

→Provide information to others (e.g., a home page)

How IT is of a disadvantage to learning.

→Face to face interaction between students and teachers may be reduced.

→The CAL package is predefined; you cannot change until the designer does

→Boring; sitting quietly in front of a computer screen since computers cannot motivate students like teachers

→The students will lose the skills of social interaction and become more isolated in their own little 'cyber world'

→Teachers will become redundant or unemployed

Impacts of ICT on the environment

→Some ICT are very hard to be disposed

→Industries have been created hence too much waste products that pollute the environment

→Too much noise from industries have killed the organisms

→Well and advance machines are in place that can plan trees, water it

→Also machines have been introduced that can cut tress in just a second

→Improper disposal of computer metal leads to environmental degradation.

→Electromagnetic radiations from computer screens compromise human life.

→Due to too much power consumed by computers; many dams have been constructed which lead to environmental degradation.

→There is a lot of heat generated by computers which cause temperatures to rise in computer labs and working rooms.

Impacts of ICT in The Following Sector

Society/ethics

-They have improved communication through e-mails, Face book

-Enabled sharing of data and information between people in different areas by utilizing network service of emailing, and social media.

-Computers have self-check systems which have increased data accuracy, reliability and data integrity.

-Many forms of entertainment e.g. online music and videos, games, sports, etc. which reduce boredom

→The rate of accessing data and information in our society is now high due to use telecommunication where info can be accessed as it happens where ever it is

Health

-Cardiac pace makers have supported patients who have problems of the heart.

-Simulation has helped medicine students to have experiences of surgery and other operations without risking human life.

-With computers medicine has been discovered to cure mysterious diseases by use of internet.

 -Internet has facilitated research and collaboration among doctors to cure diseases.

-X-ray

machines and other computerized devices have helped in diagnosis of unknown sicknesses.

-DNA tests with the help of computers have helped to identify organism's true heritage

Economy

-ICT has created jobs for machine operators, technicians, data analysts, engineers, programmers and network administrators. This has improved the economy through taxation of such workers.

-Computers have reduced on paper work costs by storing a lot of data on computer other than costly files and paper.

-Electronic commerce (E-commerce) has made business across continents easy, simpler and cheap.

-Due to computers' accuracy and reliability, production of high quality and valuable

products are guaranteed.
-Business transactions take place 24/7 hence increased productivity

Politics
-Satellites and CCTV have improved security through monitoring and surveillance of suspected criminals.
-Drones have made it easy for missions in dangerous places for humans to reach.
-Internet has facilitated communication and commanding of operations even when one is not on the ground.
-ICT has facilitated printing of ballot papers, monitoring of elections, counting and declaration of results of a given election.

Disadvantages / Negative Implications of Using IctTo:
Society / ethics
-Pornography: The influx of immoral pictures and videos on the internet has attracted children into watching them who end up being addicted.
-Culture deformation: Due to exposure to ill acts of girl-boy relationship online, youth end up in defilement and rape.
-Internet promotes inhuman practices of homosexuality since homosexuals use it to entice the young into the practice.
-People have become lazy and dependants of computers to the extent that some people can't do anything without the help of computers.
-There is a lot of kidnap as a result of relationships created online.

Health
-Wrist pain: This is as a result of prolonged computer usage.
-Back pain: This is a result of over sitting that leads to deformation of the spinal and subsequent poor sitting posture.
-People have had eye defects due to radiations from computer screens after a long use.
-Eye strain due to much light from computer screens.
-Headache. This is common with programmers because of engaging the brain to fix errors.
-Irritable desk syndrome: this is a syndrome caused by poor ergonomics/ working environment.

Economy
-Cost: Computers consume a lot of power which increases power bills.
-Unemployment: many messengers, postmen and copy typists have lost their jobs because their work is better done by computers.
-Maintenance: Computers are expensive to service and repair.
-Los of data: virus has caused organizations to lose a lot of data which leads to sabotage of operations.

-Forgery: Because of computers the rate of forgery has increased and organizations have lost huge sums of money through false pretence.

Politics

-Personal security has been jeopardized by hackers who obtain people's private information and use it for wrong deals.

-Internet provides an efficient platform for rebel group's collaboration and recruitments.

-Government secrets have landed in the hands of the enemies because of hacking.

-There has been invention of mass destructive weapons which lead to indiscriminate killing.

Environment

-Improper disposal of computer metal leads to environmental degradation.

-Electromagnetic radiations from computer screens compromise human life.

-Due to too much power consumed by computers; many dams have been constructed which lead to environmental degradation.

-There is a lot of heat generated by computers which cause temperatures to rise in computer labs and working rooms.

ICT related professions learners of ICT can opt for.

- Computer hardware technicians
- Software engineers/programmers
- Computer lab attendants
- Network administrators

- System analysts/consultants
- ICT instructors and teachers
- ICT based secretaries

Areas of self-employment that a qualified ICT person can engage in

- ➢ Running a café
- ➢ Sales and distributing of ICT items and software
- ➢ Training users on how to use ICT systems
- ➢ Offering support
- ➢ Graphic designing
- ➢ Computer technicians
- ➢ Computer engineer

- ➢ Computer operator
- ➢ Computer technician
- ➢ Computer instructor
- ➢Systems administrator
- ➢Database administrator.
- ➢Programme

USES OF COMPUTERS

They are used in our everyday life in various tasks. The following are some of the areas where ict /computers are widely used

Education:

- Computers are used for long distance learning were a student interacts with a teacher via the computer. It is called E-learning (electronic learning
- Can be used to help students learn a new subject on their own through **Computer AidedInstructions** (CAI)
- students use computer software to learn at their own pace (speed) and answer questions through Computer

  Assisted Learning (CAL)
- Teachers can use computers to mark and assess the students' performance through **Computer Assisted Assessment** (CAA).
- This hasreduced the time and labour spent marking the students' scripts
- Electronic Library (e-library) to search for books, borrowing and returning them.
- Through telecommunication one can registers, attend lectures and graduate at home.
- Notes and tests are easily shared among students and teachers through use of the internet.
- They are used to carry out educational research on every topic from the internet.

- School Management Systems are used to manage records and generate student report

Health

- Keep patient records
- Robotics are now days used to carry out surgery that requires a lot of precision
- Used to develop colourful graphic scans that can show the affected parts of the body
- They are used to carry out medical research which has brought about new medicines.
- They are used to develop colourful graphic scans that clearly show human anatomy.
- They are used to make the diagnosis of the disease and prescribe the medicine.
- Computers are used to run machines that reduce people's weight and in meal analysis.
- They are used in hospital to design forms, monitor the sick and diagnosis.
- They are used for medical collaboration through telecommunication.

Entertainment

- Watch movies
- Play video games. Need for speed
- Used to make airline schedules and hotel reservation
- Recording and playing music both video /audio
- Computers are used to analyse and create beautiful musical sounds and tones.
- Novels and all kinds of pleasure reading can be downloaded and played on internet.
- They are used to enhance Images through photo editing and touch up.

Security

- Guiding missiles in a war zone
- Military computer based training
- Computer simulations allows the military to train solders for several combat situation
- Use of closed circuit TV camera

Industrial / manufacturing: -

- Quality control
- Robots are being used to handle tasks, which cannot be efficiently handled by humans. (In many large manufacturing and production processes)
- Computer Aided Design (CAD) and CAM (Computer Aided Manufacture) are also in this category

Sports:

- To analyse the smallest movements made by the athletes
- The idea of goal-line technology, shorts on target, number of touches the individual player gets on the ball, ball possessed on either side per minute time
- Used by experts to pin point wasted energy and movements for many athletic events. This brings about improvement in performance
- Play backs by computers have helped players to realize their mistakes and improve.
- They are used to broadcast sports live events like live matches on Sky sports and DSTV.

Homes.

- Can be used to entertain, educate, keep track of your personal budget, plan meals and determine what food items to buy in a week.
- Many banks now offer home banking. You can make transfers, deposits and withdrawals with ease from the comfort of one's home.
- One can use the computer to register for a course, attend lectures at home and possibly graduate at home. This can be done through teleconferencing
- Keep home picture and documents
- Learners can do their homework at home using computer/consult by calling their class mates and subject teachers
- Through telecommunication one can registers, attend lectures and graduate at home.
- Through use of Face book and what's app one can communicate with friends and relatives.
- Security: Computers can be automated to sense smoke, water leakage and call the police. **Office automation.**

- Accurate and neat documents are created and stored through use of word processors.
- E-mail facilitates instant and efficient transmission of messages despite the distance.
- Offices use telephones to dial computers, instruct workers and store messages.
- Facsimile is used to transmit graphic and alpha-numeric data from one place to another. .
- Telecommunication enables faster transmission of messages compared to traditional method.
- Local Area Networks (LAN) facilitate sharing of files and peripheral devices instead of buying new equipment.

Government and Military.
→To design conventional and modern weapons like drones and warships

→To analyse satellite information which can help the government to seek and destroy their enemies using warships and planes

→In teleconferencing whereby different offices in different areas can meet together by the help of computers.

→Politicians to solicit (look for) for support through SMS and websites

→Electoral commission to carry out electronic voter registration, designing voters' cards, and tallying (counting) of votes

Business

They are used to automate vending machines, elevators, cars, and phones.

They are used to keep business documents in electronic which reduce costs.

They are used in banks to transfer money electronically which eases banking.

They are used in banks to work as tellers thus reducing bank congestion.

They are used for business communication through emails and telephone.

They are used to carry out business data processing e.g. computing daily sales

They are used to design receipts, bills, invoices and other business document.

They are used in advertisement of business products on TV, Radios, internet

They are used to count huge sums of money in banks and supermarket.

Dangers of Using Computers in Business

→Initial investment cost can be high (setting up)

→Some jobs may be lost due to compute computerization and thus lower the morale of staff member

→Some staff has/have to be trained or retrained

→Easier transmission of virus via the internet, which may lead to creating untimely cost to the recipient and sender computer

→Computer load personal information, which may be misused

→Problems may arise when computers cannot be used either because they are malfunctioning or damaged.

→This can bring an organization to a half if no backup exists

→Security has been provided to protect personnel and staff from preying eyes.

Science and Engineering:

They are used to carry out millions of complex calculations at required levels of speed and accuracy.

Computers are used by astronomers to test physics theories and make accurate conclusions.

Computers are used in forecasting complicated weather patterns

They are also used in processing and enhancing images or pictures (image processing).

CATEGORIES AND CLASSIFICATION OF COMPUTERS

Modern computers fall into various categories. These categories are classified in the following ways: -

- Classification by size/capacity.
- Classification by process/function.
- Classification by purpose.
- Classification by Processor Power

Classification by Size (physical size)

- Super computers or Monster computers ☐Mainframe computers.
- Mini computers.
- Micro computers

(i) Super computer (Monster computers). Weather forecasting, Space exploratory **Characteristics**
These are the biggest of all computers.

They have high mathematical capacity and they are used for complex calculations.

They are the most expensive in price

Is the fastest and more powerful in all computers and can process trillions of instructions in few seconds.

Support over 1000 users (peripherals) at a time

(ii) Mainframe computers

These are the second largest in physical size after monster They
are used by governments, big companies and banks.

They support a wide range of peripherals between (500-1000). Each user works separately with a separate keyboard and monitor but they all use the same processor Central Processing Unit)

Mainframe computers generally require special attention and are kept in a controlled atmosphere. Specially trained operators and programmers are required for its operation.

iii). Mini computers.

They possess the same working principles as the mainframe except that are a bit smaller. Users range from 50-500 at a time.

They are mostly used in medium sized organizations.

These are smaller than mainframe computers.

They can be used by 50-500 users a time.

They have a high storage capacity but lower than mainframe computers.

They have high processing speed but lower than mainframe computers.

(iv) Microcomputers. PCs (Personal Computer)

Microcomputers are smaller than mini computers and are a single user capacity.

They are mostly used computers in day-to-day work.

These are the smallest computers in physical size.

They have a high processing speed

They have a low storage capacity compared to the others

They consume less power

They are easily portable hence suitable for mobile computing

Examples of microcomputers include:

Desktop computers (PC)	Palmtop
Tower computers (PC)	Note books
Laptop	PDAs (Personal Digital Assistant

Laptop: These are designed for mobile computing.

Characteristics

- They are portable due to their size.

- Have limited support of peripheral devices.
- Fast in processing information

Palmtops: These are hand held devices. They can fit in the palm of a hand, hence the name.

PDA (Personal Digital Assistant). These are hand held devices. Can fit in a shirt pocket and at any time, one can check e-mail; take a few notes, etc.

They are designed for persons who are ever on move.

Notebook computers – it is small in size and low weight and can be carried anywhere.

Classification by Function/Process

They are classified according to how they process and present data.

Digital computers

Analog computers

Hybrid computers

(i) Digital computers

Digital computers process and present data in form of discrete values.like 1, 2, 3 … they don't present decimals or fractions. Examples of digital computers include pocket calculators, digital watches, etc.
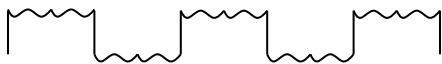
Digital signals

Analog

Analog computers process and present data in form of continuous measurable quantities/units. They usually measure the quantities of nature like pressure, temperature, volume and weight. Examples of Analog computers include thermometers, voltmeters, speedometer, barometers etc.
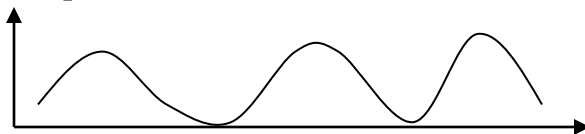
Analog signals

(iii) Hybrid These are computers which process and present data in form of discrete values as well as continuous measurable quantities. They possess the characteristics of Digital and Analog computers. All modern micro computers are hybrid. (Laptops, tablets, desktop computers)

Classification by Purpose
- Special purpose machine.

- General purpose computer.

(i) Special Purpose Computers They are designed to handle only a specific task(s). Their form of operation is restricted in nature, e.g. digital watches, pocket calculators and robotics

ROBOT: Is a computer-controlled device that can move and react to feedback from the outside world -

Progra
mmab
le
comp
uter
machi
ne

→Car assembling
→Bomb detection
→Inside dangerous chemical areas
→In military operations which may
seem to be risky

→Tasks that requires repetitiveness and precision
→Repetitive
→Lifting heavy equipment
→high degrees of precision

some time designed in human shape like to perform work ordinarily done by a human beings-A computerized remote controlled machine that
mimic/assume human intelligence

Application areas of robots

→Fire fighting

(ii) General Purpose Computers
Designed to solve a wide range of problems, they perform a variety of tasks by means of specially written programs. These can perform calculations, keep date and time, process documents, store databases, etc.

Classification by Processor Power
Due to the rapid change in technology, processor power has also increased and the computers are getting faster and faster. The higher the processors power the faster the computer.
This, computers are classified according to the speed with which a computer responds to the user requests.
The categories under this classification include;

80286 or 286   Pentium II or Pentium Pro
80386 or 386   Pentium III
80486 or 486   Pentium IV
Pentium I (80586)   Core Processor

Define the term computer literacy.

→The ability to comfortable use the computer and its associated accessories.

→The knowledge and ability to use computer and related technology efficiently

→Comfort level someone has with using computer program and other applications that are associated with computers

Digital divide

The **gap**that exists between the technologically advanced and the technologically backward

Define A Computer Laboratory.

A special room where computers are kept efficiently for learning

Factors to consider when setting up a computer lab

↔Availability of power

↔Well ventilated room

↔Availability of firefighting equipment Lab physical security

↔The room should be away from dust roads

↔Availability of enough capital

↔Number of computers to be accommodated (size)

↔Lab should be established in a safe place free of dust (location)

↔Purpose of the lab

↔Budget

Ergonomics refers to minimizing injury or discomfort while using the computer

Steps to follow:

→Position monitor correctly   →Take a break

→Use adjustable chair   →Ensure adequate lighting

→Assume proper position while typing

Identify five health hazards associated with the prolong use of computers (5mks)

→Headache   →Back pain

→Wrist pain   →Eye strain

→Cancer due to electromagnetic radiations   →Fatigue

→Neck pain   →Stress

Ways of preventing health effects of computers.

→Always take a break to avoid fatigue

→Use a rotating chair to avoid back pain

→Use a anti-glare screen/or reduce a light on your screen/or use LCD to avoid eye strain

→Position your monitor proportionally to eyes to avoid neck pain

→Assume proper position when typing

Ways you can ensure safety of computers in a lab/ computer lab security..
→Installation of detective alarms and buzzers
→Employing security personal to guard the computer lab physically 24 hours
→Rules and regulations
→Make sure that all the computers lab equipment such as computer and other assets are locked down through cabling or other means to enhance physical security.
→IT labs are monitored either in person by lab technician, remotely through security cameras or a combination of the two
.→If possible, equipments should be placed to limited access

→All PC should be physically checked for unauthorized hardware devices on a periodic basis.
→Use of strong padlock and keys

→Installation of burglar proofs e.g. metallic doors etc

→Deployment of security guards

→Installation of closed circuits camera

→Installation of detective alarms and buzzers

→Building of perimeter walls

Measures you would take to control physical access into computer installation

→Lock and key   →Physical armed security personnel

→Burglar proofs   →Processed devices for identification

→Alarm systems   →Biometric devices

QN. Fred, wants to open up a computer laboratory at his school, identify 6 safety precautions that Fred should strictly observe.

↔Install fire extinguishers

↔Install burglar proofs

↔Ensure stable source of power

↔Ensure proper laying of cables.

↔Put rules to guide users

↔Install fans/ cooling systems

b).Identify any 18 Computer lab rules

→Switch off computers after use.

→Scan external storage devices before using them.

→Avoid playing free games in the computer lab since they may contain viruses.

→Scan suspicious mails before opening them.

→Avoid opening unknown mails.

→Never fix computer cables by yourself.

→Bags and pullovers should be left outside the computer lab to avoid loss of small computer components by the computer learners

→The computer users should switch on and off computers in a proper way to avoid damages

→Food stuffs and drinks should not be brought in the computer lab to avoid pour

→The devices positions should be maintained and learners should avoid un necessary disconnections to avoid short Circuit

→Physically, be careful, avoid knocking and dropping any hardware to the ground as this could cause any of the delicate components to break or be damaged and stop working

→Proper shut down of computer should be followed to avoid disk and system failure so avoid abrupt switching off

→Do not open metallic cover of computer or peripheral devices particularly when the computers power is on to avoid system Circuit

→Keep fire sources out and far from the computer lab

→Removable storage devices should be scanned before opening them in computers to avoid viruses

→Avoid running in the lab because wires can trap you and fall down

→Scan suspicious mails before opening them and avoid opening unknown mails

→Do not bring in magnetic material/object to avoid easing of data on some magnetic disks

Importance of the following computer lab equipment.

Air conditioner
-Modify the condition of air in the lab such as cooling
-Regulate dust accumulation in the lab
-To provide a conducive room temperature for users.
-To regulate dust accumulation in a computer laboratory.
-To dispel insects that could cause harm to the computers.
-To dispel bad smell from users

Wool carpet
-Absorb dust
-Reduce effects of damages when light objects fall
-Minimize effects of electric shocks
-Absorb electrical radiations from computer devices
-Provides a non-glare surface that reduce reflection and eyestrain
-Better insulation
-Reduce noise
-Prevent slips and falls when falls do happen, chances of injury are greatly reduced on soft flooring.

Computer dust cover
Prevent dust from reaching the hardware components of the computer system and also protect the computer moisture and dust

Anti glare screens
Prevent eye strain and fatigue caused by over bright monitor
To also reduce electromagnetic rays from CRT monitors

Blower
To remove dust accumulation from hardware components and system units

Surge protector like Voltage stabilizers: helps to regulate the level of voltage/electricity that

enters computer and other devices in lab so that electricity does not affect our computer.
<u>Un interruptible power supply (UPS)</u>

-Protects the computer from sudden power loss

-Power backup that provides alternative source of power in case of power blackout

-It regulates the amount of power use by the computer

-Temporary power storage unit for the computer in case of power blackout.

NB.**A surge protector:** only protects a computer from high voltage while **UPS** protects the computer from sudden power loss/temporary power loss unit for the computer in case of power blackout

Gaseous fire extinguisher
Put off fire in case of an outbreak
Water proof covers
To prevent water from reaching the main parts of computer system
Protects the computers from moisture and liquid substance
Security cameras: You can install security cameras (closed circuit television -CCTV) which can help you inspect the place to avoid people that many need to move out with some gadgets
Alarms and buzzers: are devices that can be attached on computer and if someone touches on the device, the buzzer or alarm will make sound
First aid boxes: there is a need to put these boxes in place so that in case of a danger, the victim is helped early. In the first aid box you can put bandages, eye pads, pair of gloves, dressings, safety pins, plasters and some others

 Others:
- **Form** – for cleaning duty monitors, keyboards and system units
- **Software kit** – for reinstalling or repairing applications and virus detection and cleaning.
- **Masking tape** – for labelling devices accordingly
- **External drive** – just in case one does not work properly.

Ways you ensure safety of computer hardware in a lab
- use passwords
- Activating firewalls
- Locking hardware devices on tables using hardware locks
- Frequently dust blowing the computer
- Providing stable power supply

- Installation lightening arrestors on the computer room
- The lab should be well laid out with enough space for movement of user
- Cables and power sockets should be well insulated
- Power cables should be of a correct rating to a void short circuits
- Maintaining of entry and exit user log.(to record users that have used a particular computer to monitor crime committed)

Ways of ensuring continuous use of a computer

- By regularly servicing the computer
- By upgrading computer software
- By updating computer software
- By covering a computer to a void dust from entering a computer
- By use of air conditioner facility
- By training workers into better methods of using the computer facilities
- By employing trained personnel to help in areas of computer use difficulties
- Install an antivirus program to reduce damages caused by viruses onto hardware
- By implementing physical access guidelines to users
- Penalize user who intend to vandalize computers

BOOTING AS USED IN ICT.
→Starting or restarting a computer and it loads operating system into its memory (RAM)
They are two types of booting: Cold booting and warm booting
Cold: Starting a computer which was initially off /initial starting/powering of a computer after it has been powered off completely WHILE. **Warm** booting is re-starting a computer

Initial procedure of powering a computer system
→First make sure you have a stable power source
→Make sure all the components are well and firmly connected
→Switch on the mains power source
→Switch on the stabilizer/UPS (in case you have one)
→Switch one the system unit because most of the parts including the power supply unit are in it.→Switch on the monitor reason being that what it displays comes from the system unit.

The first 4 correct order of shutting down a computer
Step 1: Close all applications (Active window)
Step 2: Click on the start button &then click on shut down or turn off computer.
Step 3: Select the options shut down or turn off and ok or yes.
Step 4: Finally switch off the system unit and monitor

.**N.B**: If your computer does not turn off automatically a message appears when you can safely turn off your computer.

Dangers of improper shutting down your computer
Crashing of hard disk
Loss of data
Corruption of files

NB. The use of RAM in relation to booting
Provides storage of the kernel that is loaded into RAM to enable the computer to boot.

Reasons for restarting a computer. (For carrying out warm booting)
→When you have installed a new hardware
→After installing software
→After changing CMOS or BIOS setup
→When the computer freeze or locks
→After uninstalling a software program.
→When the computer slows down.
→When a computer has a virus, it can constantly restart itself

Give three ways <u>HOW </u>one can be re-start a computer
→Chose start >shut down >restart.
→Pressing CTRL+ALT+DEL twice
→Pressing the computer reset button

The booting sequence is divided into two
→Front end booting stages
→Back end booting stages

Front end booting stages are those done by the computer user. They are also regarded as proper ways of starting up a computer and it includes
→Ensuring proper power cable connection to computer
→Switching on the main switch
→Switching on the monitor
→Powering the system unit by pressing the power button.

Back end processes take place within the computer after the user has pressed the power button on the computers system unit. They involve the following

→**POST**: This is first instruction to execute.
It checks the PC components and ensures that everything works

→**BIOS**: This resides in ROM.
At this stage the computer is checked to establish whether basic input and output devices necessary for the start-up are available.
→**Boot Loader**: This handles loading the operating system into memory and then passes control of execution to the operating system

→Finally the computer starts

Note: generally if asked to mention processes involved in booting a computer without the question specifying front end (for human) or back end (for the computer) then a student is supposed to give the following

→Switch on the computer mains
→Switch on the computer from the power button
→**POST**: This is first instruction to execute.
It checks the PC components and ensures that everything works
→**BIOS**: This resides in ROM.
At this stage the computer is checked to establish whether basic input and output devices necessary for the start-up are available.
→**Boot Loader**: This handles loading the operating system into memory and then passes control of execution to the operating system
→Finally the computer starts

Forms of disaster that can befall computer systems and installations.

→Fire out breaks   →Acts of terrorism

→Water from leaking roofs   →Robbery
→Lightening   →Collapsing buildings and tables

Way system failure can be controlled.
  • Frequent backup of data.
  • Replacing old hardware with new
  • Installation of UPS.   hardware.
  • Installation of firefighting gadgets.
  • Use of power regulators.
  • Use of surge protectors.

Computer trouble shooting.

→This is a form of problem solving often applied on repairing of failed product or processor.
→The process of
identifying and fixing a computer problem with hardware, software and many other products

Common examples of computer errors/ problems include:
Freezing, Hanging, Computer restarting

Ways how you can troubleshoot a computer that has failed to start.
→Restarting the computer
→Re fixing power cables
→Change of RAM chips
→Checking the power voltages.
→Blowing the CPU and RAM slots

The computer failing to complete the booting process. This can be overcome by
→Restarting the computer
→Re fixing power cables
→Changing of RAM chips
→Ensure there is required power voltage.
→Blowing the CPU and RAM slots.

→Ensure proper cable connections.

Programs not responding. This can be fixed by:
→Restarting the computer
→Using the task manager to start the program
→Refresh the computer
→Scanning the computer for viruses
→Re install corrupted files in the program.

Importance of Servicing and maintaining a computer
→To prevent data loss
→To extend computer life span by protecting both hardware and software
→To increase its operation speed
→To remove bugs
→To prolong the life time of hardware
→To repair computer components with mechanical faults

→To update outdated software programs such as Antivirus

→To cut down costs involved in buying new equipments

→No interruption prevents damage of equipment-UPS

Tools one needs to service a personal computer
- Antivirus
- Blowers
- Utility program
- Backup CD

Methods you can use to enhance/improve the speed of a computer
- Increase on RAM capacity
- Delete unnecessary files and folders
- Clean the system off viruses
- Re-install the operating system
- Do no install a too heavy anti-virus utility

THE CONCEPTS OF GREEN COMPUTING

→Environmental   responsible   use   of   computer

→This   is   the   use   of   ICT   in   line   with   environmental   conservation.

→The environmentally responsible use of computer and related resources.

The following are some of the ways in which we can use ICTs without affecting the environment negatively:

➢ Reduce or use noise proofs to avoid polluting the environment because noise can kill some organisms

➢ Recycle the old ICT devices like old monitors, printers, radios and others to make new ones

➢ (**Green disposal:** i.e. Re-making an existing computer or appropriately disposing of ,or recycling unwanted electronic equipment)

➢ Do not use ICTs to make hazardous materials that can kill environmental components

➢ **Green manufacturing:** i.e. minimizing waste during the manufacturing of computers and other subsystems to reduce the environmental impact of these activities)

➢ Use monitors that produce less or no radiation (LCD or Gas plasma)

➢ **Green use:** i.e. minimizing the electricity consumption of computers and their peripheral devices

- ➤ **Green design:** I.e. designing energy –efficient computers, servers, printers, projectors and other digital devices
- ➤ do not leave the computer running overnight
- ➤ turn off the monitor, printer and other devices when not in use
- ➤ use paperless methods to communicate **Green computing approaches**

- ➤ Use of Cloud computing
- ➤ Use of LCD monitors
- ➤ Use of Smart phones
- ➤ Proper disposal of hardware
- ➤ Use of Laptops with batteries

Advantages of green computing Care
  for the environment
  Responsible computing
Responsible installation, utilization and disposal of ICTs

Toxic substance from computer components
Mercury, Lead, Chromium, Cadmium, Arsenic, Zinc, Barium

INTRODUCTION TO FILE MANAGEMENT

File management: is the system that an Operating Systems program use to organize and keep track of files
File format: Is a standard way that information is encoded for storage in a computer file
Folder/directory .A storage location for related files and sub-folders
→**A** collection of files and sub-folder stored as a group given a unique name
→This is a virtual container for files and other folders called sub-folder
Folder can be divided into small units called subfolders. Therefore a folder in another folder (Folder inside a folder)
A file is a collection of related data or information stored in one location and given a unique name (**called the filename**) for ease of access.
Every file is made up of two parts/details/features:
i).A unique name (file name) and an optional extension (a file extension) separated by a

period (.) a dot

The name and extension are separated by a period (.) eg. JUNE .DOC

In this case the file name is June and the extension is .DOC.

File extension: is a part of (suffix) at the end of a filename which identifies the type of file it is

→A file extension is the end part of a file name that is separated by a dot, containing characters based on the program used to create the file

→Enables one to know the program used to create the file

→Helps the computer select a an application to open a file

→**In other words;** It identifies what program to associate the file with and how to properly open it using the correct program

→The extension helps to identify the file type.

Assignment   .   Doc

File name   period   File Extension
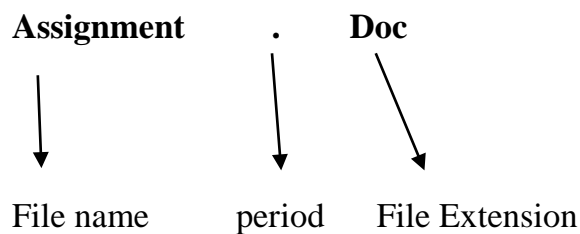
EXAMPLES OF PROGRAMS AND THEIR FILE EXTENSIONS

Ms Word	.doc/dox
Batch file	.bat
Executable file	.exe
Text file	.txt
Ms Excel	.xls
PowerPoint	ppt
Publisher	.pub
Image files	.jpg

Sound files	.mp3
Video song.	. Mpeg
Rich text format	.rtf
Portable doc format	.pdf
Systems file	.sys
Portable network graphic	.png

Two Types of files
System file. Is an executable file (in machine language) that is part of the operating system or other control program that contains critical files need for the smooth running of the operating system?

Application files. Also called program files these are word that hold application program data or direction.e.g. doc file is an application file for Microsoft application

NB. In graphical user interface such as **windows** and the **Macintosh** a folder is an **object** while in **DOS** and **UNIX** worlds; a folder is called a **directory**

Directory-This arranges related files together for quicker access

Mention two ways a file is kept secure in a computer.
→By installing a latest copy of an anti-virus program.
→By encrypting files.
→By limiting physical use of computer facility to users.
→By backing up files regularly.
→By avoiding the usage of old storage devices.
→By sensitizing users about the need to keep files secure.
→By punishing offenders that change files.
→By applying keeping a log of users to monitor their activities.
→By pass wording files
→By avoiding the usage of old storage devices

File Path
Is an address which can direct someone where a certain file is located Can also consist of location of file .user profile, folder, subfolder(s) file name and file type.

D:\ guest\ my documents\ subICT\ S.5results.doc

Location   folder   file name

User profile   sub-folder   file type (extension)
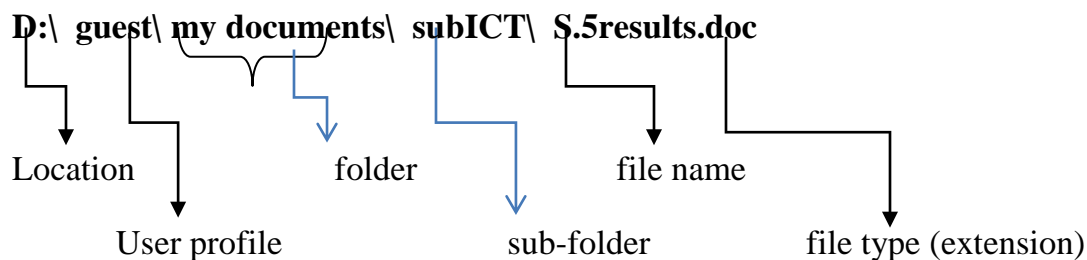
Another example is of **MP3file** named AZONTO in a folder audio located on the desktop on local disk **C**

We can write the path or address as follows
C:\user\desktop\audio\azonto.mp3

Types is   mp3

File name is   a zonto

Folder is   audio

Location   desktop

Profile is   a user

Storage on a drive   C

C;\admistrator\picture\sunset.IPG

C   Hard disk partition\location on
which it is saved

Admistration   profit of the person who created the file.

Picture   folder that contain the file

Sunset.   file name

JPG   file format

.D:\ Guest\ My Documents\ Notes\S.6mid\ Paper One.Pdf

i.Name the storage device

location where the file is stored…**partitioned D**
ii.Which program was used to create a document?...**portable format (pdf)…….**
iii.What is the name of the file that is open?....**...paper one………..**

iv.Mention the folder where the file is stored……**notes………**

v.What is <u>my document</u> representing in this path?....**area/place where you can find/get your folder….**

vii.What is S.6 representing in this path?......**sub-folder…….**

viii. Guest means that……**profile/privilege (user account of the person who designed a text)**

xv**.** suppose instead of **D:** was **C:\\,** what would be the area location where we can get/find our document **?It would be on the desktop**

A DRIVE: Device that reads from and writes to disc. A drive is a slot or an opening where a storage device or disk is inserted
Various media for storage have their representative drives in which they are contained during read or write process. These disk/tape drives and are represented by letters of the alphabet followed by a colon.(:)
DRIVERS: Operating Systems recognizes storage median or devices as (drives) and may be given labels such as letter A-Z to identify them

Drive Name	Drive Letter
3.5" Floppy Drive	A :
5.25" Floppy Drive	B:
Hard disk (non movable)	C:
(CD-ROM drive) system drives (normally network drives non-movable)	D:
Others (Flash disk,Tapes etc.	E:-Z:

Note: In some instances, the hard disk is partitioned into several parts. This means that the drive letter for the CD will be changed. For example, if my hard disk is partitioned into two, one part will be labeled C: and another D: thus making the CD-ROM drive E: and the other will start from F-Z:

Icon Is a picture on a screen that represents a specific file, directory, hardware resource, Program, etc

Common examples of an icon

→My computer

→Recycle bin

→My network places

→My documents

→All programs installed like……?

Desktop: This is the first screen that displays after the computer has fully booted

Wall paper: This is the background of one's desktop. It is always a picture

A Screen Saver is a utility that causes the monitor's screen to display a moving image or blank screen if no keyboard or mouse activity occurs for a specified time period.

The screen saver starts playing on the screen if the computer is left idle for a set period of time.

Applications of a Screen Saver Program

→They were originally developed to prevent a problem called ghosting, in which images could be permanently etched on a monitor's screen.

→Screen savers can also be used for reasons of security.

→Prevents unwanted onlookers from accessing information or data from your computer.

→Business- advertisements on the screen.

→Entertainment – digital photos can be put on screen as moving pictures.

→The screen saver is used to prevent screen burn out /in.

→Used to display system status information

Elements that can display on the desktop screen of a normal working computer

→Icon

→The start button

→Task bar

→Notification area

→Windows desktop background

THE COMPUTER SYSTEM?

A computer system refers to the hardware, software, data and data processing personnel. **OR**

A computer system refers to the co-ordination that is required between the hardware, software and human ware to produce and to enable the computer to produce work or perform the required tasks

COMPONENTS OF A COMPUTER SYSTEM

The components of a computer system are divided into 4 categories:-

- Hardware
- Software
- Human ware (Data Processing Personnel)
- Data

HARDWARE COMPONENTS OR COMPUTER HARDWARE

- Hardware components of a computer system are the physical parts of the computer system.

- • - These are physical components of a computer that one can touch, feel and weigh. Example; monitor/screen, keyboard, mouse, system unit etc.

The computer hardware components are categorized according to the functions they perform, and according to the way they are connected.

Those that are categorized according to the way how they are connected are called **peripheral devices** and **system unit** hardware

Peripheral devices they are connected to the system unit from outside externally
While **System Unit** hardware are inside the system box/unit and can only be seen and touched when the box is opened.

What is the system unit (system case)? This is a box like computer device that contains the internal components of a computer. **System case**

- • It houses the processing hardware for the computer
- • Protects the internal parts against dust, water etc
- • Facilitates movement of the system as a unit

Examples of System unit Hardware

- • **Power supply Unit**.
  →Give power to the rest of the computer:
  →Regulates power to the required levels
  The role of a power supply unit is to:
  - Step down the incoming power.
  -It regulate power to the required level
  - Converts the alternating current (AC) from Direct current (DC)
  - Distribute power to other parts of a computer. Each and every part inside the computer has to receive power e.g. memory chips, data buses.
- • **Random Access Memory)** it is where data goes when you are entering it in the computer. **(**The working/temporary storage space of a computer)
  →It holds files and programs of a computer which are being worked upon. Provide the working space for loading programs/applications
  →Provide the read and write space for editing and formatting of files
  →Contribute to the speed at which programs are loaded
- • **Disk Units**. Without them, it would be difficult to perform the process of storing the work permanently as it would be remaining the main memory.(RAM) example of

these units is the

- •**Internal hard disk**

  →Stores computer programs and software (how?)

  →It stores user information permanently

- • **Mother board**- where all circuits are plagued

  →It provide connection point for all computer components through slots/port

  →It supplies power to small internal components of the computer

  →It ensures coordination among internal components of a computer through circuit lines

- • **Complimentary metal-oxide semi-conductor battery (CMOS).**

  Is memory used to store configuration information about the computer which includes amount of memory, types of drives current date, time, passwords among other**s**

- • **Video card/VGA.** It provides an interface for a monitor to connect to the motherboard. (interface: The interaction between)

- • **Data Buses**: These are highways on which **data travels/** moves to different parts of a computer. Using data buses, data can move from the **keyboard**, to the main memory. Therefore, transmits data from point to point within the computer system

  Fun: It cools down the processor. It blows off dust from the processor

Those that are categorized according to the functions they perform may include: -

1. Input devices (hardware)
2. Output devices (hardware)
3. Processing hardware devices
4. Storage devices

State four classifications of computer hardware

→**Input devices**-components that enter data

→ **Storage devices-**components that store information either temporary or permanently

→ **Processing hardware** –devices that convert raw facts into meaningful information

→**Output devices** –components that displays/bring out computer held information in either hardcopy or softcopy.

Softcopy-digital copy Is the page of work displayed on a
computer screen

 Hardcopy. A page of work printed on paper or any other printing medium [cloth]

Give three situations where a hardcopy is preferred to a softcopy

→In a situation where stamp is required

→In a situation where handouts are required

State two devices that can be used as both input and output.

- Digital camera.
- Touch screen.
- Smart board.
- all in one printer

List three examples of input devices (3mks)

- Keyboard
- Scanner,
- Mouse
- Digital cameras,
- Joystick,
- Touch screen

Other input devices

- **Stylus and graphics tablet**: Pen like pointing device which uses pressure to write text and draw lines
- **Optical Character Recognition Reader (OCR):** These include a small optical scanner for reading characters and sophisticated OCR software for analyzing what is read.
- **Optical Mark Recognition Reader** (OMR) used to sense handwritten marks such as small circles or rectangles made on pre-printed forms in certain places
- **Bar Code Reader Magnetic Ink Character Recognition Reader** – Can input (read) text printed with magnetized ink.
- **Magnetic Strips Reader** – Used top input (read) information contained in the magnetic strips on cards like ATM cards, and credit cards
- **Microphone** – An input device that allows the speaker to speak to the computer to enter data and instructions into the computer.

- **Voice Recognition Device** – is the computers capability to distinguish spoken words.
- **Web cam** – A video camera whose output displays on the web page.
- **Sensor or remote sensor** – input device that can detect external changes in an environment
- **Biometric Devices**-Electronic devices that can understand and interpret configured biological parts/human being character.
- **Digital Video camera**
- **PC Camera**
- **Graphic Tablet**. Flat rectangular electronic plastic board on which a stylus writes or draws
- **Voice Recognition Device**. All types of microphones which are used to capture sound.
  Joystick. For playing computer games
  Magnetic ink character recognition devices. Can read txt printed with magnetized ink (cheques)
  Optical character recognition devices. Scans x-ters and read objects, picture and drawing

A printer is an out device that produces hardcopy (change softcopy to hardcopy).

A scanner is an input device that enters a softcopy (change hardcopy to softcopy)

WHAT IS A PRINTER

A printer is an output device that brings out computer held information on paper or any physical medium.

Two categories of printer.

Impact-make noise while printing e.g.dotmatrix, line, daisy wheel and character printers)

Non-impact: they don't make noise while printing e.g. lease, desk, inkjet and thermal

Advantages of Impact Printers

1. They are not very expensive
2. Some impact printers are very fast; they can print at a speed of 160cps thus increasing productivity.
3. They are easy to maintain; their print heads only require periodic cleaning.
4. They are reliable; they can print over 100 million characters in their life span.
5. They can print on continuous paper especially dot-matrix printers

Disadvantages

1. They are noisy during operation. Because of the contact between print heads and the print medium

2. They have a lower print resolution compared to other types of printers
3. The head usually overheats during long hours of printing which slows down the process of production.
4. They are slower in printing compared to non–impact printers

Advantages of nonimpact printers

→They are nearly noiseless since they do have very few moving parts to generate the noise.
→They also consume very little power (almost a sixth) compared to other printers. →Their print mechanisms are reliable because they do not experience inconveniences with paper jams or blocked nozzles.

→Thermal printers produce clear and crisp images with very high resolution

(b). Mention any two practical uses of the light emitting diode on a printer.

✓ Shows whether the device is ready.
✓ Shows whether the device is idle.
✓ Shows whether the device is on.
✓ Shows whether there is a problem e.g. paper jam.
✓ Shows whether the printer tray has run out of paper.

Advantages of using thermal printers

- They are nearly noiseless since they do not have any moving parts to generate the noise. The paper is placed into the printer and characters are formed as they get heated.
- They consume very little power (almost a sixth) of other printers.
- They are reliable because they do not experience inconveniences with paper jams or blocked nozzles
- They produce clear and crisp images with very high resolution.

Disadvantages

- They cannot print on any paper because the heat generated will not cause any discoloration without burning the entire paper.
- The paper used has a limited shelf life. It can be affected by age, sunlight, humidity and other chemical vapors which may cause it to discolor completely thereby causing the wordsto disappear.
- The paper has to be specially prepared before they can be used in printing, which creates delays.
- Their print heads cannot be serviced or repaired, which makes them expensive to maintain. The whole print head must be replaced

- The printing speed is also so slow because the heads have to be allowed time to cool before the next printing cycle.
- They have a shorter life span than other printers. Their print heads are expected to print a maximum of 10 million characters accurately whereas other print heads like dot matrix printers go over 50 million characters in their life span.

Ways you can care and maintain your printer

- Keep your printer clean
- Keep it covered
- Turn it off when not in use
- Use it frequently to ensure its proper working condition
- Carry out maintenance every 1 or 2 months
- Avoid cheap/refilled ink cartridges and toners
- Avoid also cheap paper because can affect the print quality due to paper jam

Factors to consider when buying A printer

- Resolution
- Speed
- Ink cartridges and toner
- Cost of the printer

Demerits of dot matrix over laser jet

- Very slow at printing work
- Produce a lot of noise
- Produce poor quality out put
- Expensive to use in the long run

Use of light emitting diodes on a printer

- To report errors in a device e.g. paper jam
- Indicates activity hardware is carrying out
- To show whether the device is ready
- To show whether the device is ldle
- To show whether the trays of the printer are out of paper ☐To show whether the device is working/is on

Situation That May Let A Printer Not Working

→Paper jam

→Printer may not be installed in the computer system

→Printer has run out of paper

→Printer may have mechanical faults

→Printer has run out of ink/cartilage

NB. Paper per minute (PPM)
Number of pages a printer is capable of outputting in a given period of time.

The Monitor
This is an output device that displays a softcopy (Non- tangible copy) as visual information.
The size of the monitor is measured in diagonally and in inches There are
two main types of display devices or monitors
A video screen with a cathode ray tube (CRT) with extended hind part which is used to project a
beam of electrons at a fluorescent surface that emits light and creates images.   A
video screen with a Liquid Crystal Display (LCD). Which is flat and smaller screen
with liquid crystal rather than a cathode ray tube to create images on the screen
Advantages of CRTs
→Can produce fast and good color output
 →They have a very wide viewing angle
→They are cheaper than LCDs
→They have a better resolution
Disadvantages of CRTs

→Emit higher EMR (Electromagnetic radiation) than LCD monitors
→Consume more energy than LCD Monitors
→Occupy bigger space in the room
→Not easily portable
Advantages of LCD

→Requires less desk space
→Are more energy saving (Use less power)
→Radiation emitted by it is negligible
→Have good resolution
→Are more portable
→Can easily be mounted/planted/pined on the wall
→They are lighter and therefore easy to transport
→Have little radiation and thus have less effect on the eyes

Disadvantages of LCDs

→They are more expensive than CRTs
→They have a very narrow viewing angle
→They have a relatively poor output compared to CRTs
→Slow response at times

Terminologies

→**"Dead Tree Edition"** The printed paper version of written work

→The quality of a monitor depends on the **Resolution.**

→**Resolution.** Is the sharpness and clearness of an image Measured in **dots per inch (dpi).**

→**Dot Per Inch (DPI)-**Number of dots that make up a picture in a small space of an inch**.** It explain how clear the image printed on paper can be depending on the number of dots that make up a picture in an inch

→**Dot Pitch.** The vertical distance between each pixel, which is a measure of image quality.

→The smaller the distance the sharper the image

→**Refresh rate.** The speed that the monitor redraws images on the screen. Measured in Hertz (number of times per second).

→**Pixel**: stands for picture element. A single point in a graphic image.

→And the more pixels used to represent an image, the closer the results can resemble the original.

→The distance between each pixel to the other is one we call dot per inch

→**Refresh rates**: The number of times in a second that a monitor draws the image or information repeatedly on a screen

→The speed taken to complete a cycle can be referred to as frequency measured in hertz. The higher the refresh rate, the higher the clarity of the image

Devices that can act as both in/out

→Touch screen

→Fax

→Smart phone

→Digital camera

Information Is Stored/Held In The Computer in Inform Of Bits And Bytes

A bit is abbreviation for **B**inary **D**igits

A byte is a standard unit for measuring data or a group of eight bits put together

8BITS	1byte
1KB	1000bytes
1MB	1000000bytes
1GB	1,000,000,000bytes

OR equivalent to;

1KB (kilobyte) = 1024 bytes (2^{10} bytes) ----$\approx$ 1000 bytes.

1MB (megabyte) = 1024KB (2^{20} bytes) ----$\approx$1million bytes.

1GB (Gigabyte) = 1024MB (2^{30} bytes) ----$\approx$1 billion bytes.

1TB (terabyte) = 1024 GB (2^{40} bytes) ----$\approx$1 trillion bytes.

Primary Storage Vs Secondary Storage.

Primary storage is the working space of the computer that temporarily holds all open Programs(volatile)e.g. RAM & ROM.**WHILE** secondary storage offers permanent storage of one's information for Future reference.(backup or non-volatile

NB. Backup Involves making multiple copies of a piece of data

RAM	ROM
It is Volatile	It is non-volatile
It can be read and written to	Its contents can only be read
It offers temporary storage	Offers permanent storage
Its size can be increased	Its size may not be increased

Merits of RAM in relation to computer

→Working space of the computer

→Holds the OS of the computer when the computer is on
→Holds the programs being worked upon by the CPU and releases one at a time.
→Determines the speed of the computer

Give three commonly used storage devices

→Hard disks/fixed disks   →Tapes

→Floppy disk/diskette   →Zip drives

→The compact disks (CD-ROM) or CD   →Punched cards.

→Flash disks   →Memory

State any three advantages of using compact disks for data storage.

- Relatively cheap if compared with jump/flash drives, HDDs and memory cards
- Relatively permanent
- Come in a variety of sizes – i.e. mini and full sizes
- They are portable
- Take several forms – re-writable, recordable, etc

Classification of storage devices according to the technology used to read and record data.

Magnetic-Devices that uses a magnetic head to write data to and from a magnetized medium.

Examples Devices that use magnetic technology.

→Magnetic tapes →Compact audio cassette

→Reel-to-reel audio tape recording

→Digital audio tapes →8-track cartridge

→Floppy disk

Solid state/static: Device that is purely electronic with no moving part

→They contain no mechanical parts. Allowing data transfer to and from storage media to take place at much faster speed

→It provides a more predictable lifespan for the storage media

→They also requires less power and cooling

→They are generally lighter

They come as

Solid state drive-flash memory disk **Solid state card-**memory card

Solid state modules-microfilm, microfiches

Optical-Devices that use laser light

technology to store and read data to and from the it

Data is written to a surface of a disc by spinning while focusing a high power laser beam .CD/DVD

The RAM size determines the speed of the computer. Give any two characteristics of RAM.

→RAM is temporary (volatile) storage because its contents disappear when the computer is switched off.

→Its contents are user defined i.e. they can decide what can be contained in RAM.

→RAM can be changed or removed.

→ Occupies the major portion (70%) of the main memory

→RAM size can be changed or increased.

→The contents of RAM can be read and written to

Explain two types of RAM in a computer.

Static RAM (SRAM).is very fast
compared to DRAM and holds its contents as long as there is power.

Dynamic RAM (DRAM).however; can hold its contents for only a short period of time even when power is on. The contents of DRAM can be maintained by refreshing the memory chip several times per second

Write short notes on the following

Microprocessor/CPU.(Central Processing Unit)→This is an integrated circuit (chip) that does the entire full scale computing

→A hardware component where all operations of the Computers take place.

The CPU consists of three main parts: The two functional units and a set of workspaces that is Control Unit, Arithmetic Logic Unit and Registers as its workspace.➤The control unit (CU)

➤The Arithmetic Logic Unit (ALU)
➤The Registers.

Control Unit

→It does the fetch, direct and forward activities within the CPU

→It controls directs and coordinates most of the activities carried within and outside the CPU during operations.

→Interprets and carries out basic instructions that operate a computer.

→It has the overall function of controlling and coordinating all the operations within the C.P.U.

 In short, it fetches instructions from memory, translates it and interprets it to computer and sends instructions to other computer hardware units to execute them. And determine the next instruction to be executed

Arithmetic and logical unit. This is a section where the actual execution part of the

instruction cycle takes place during the processing operation.

Function

→It performs the arithmetic

→It carries out comparison of data items

→It carries out logical operation

Arithmetic operation includes-addition, subtraction, multiplication and division.

Comparison-involve comparing one data item to another by using three conditions; greater than (>), less than (<), or equal to(=)

Registers.

Registers are high-speed temporary storage locations used to hold data and instructions.

It stores data within the CPU during, before and after processing temporary

Holds data or instructions during data processing.

Examples Of Register

→**Accumulator**: this temporarily holds the results of the last step of ALU

→**Instruction register**: this temporary holds an instruction just before it is interpreted into a form that the CPU can understand

→**An address register**: this temporarily holds the next piece of data waiting to be processed

→**Storage register**: this temporary holds a piece of data that is on its way to and from the CPU and the main memory

State Any Four Operations Of The Machines Cycle Of A Central Processing

Unit This is are series of operation needed to execute a single instruction and these are;

. **Fetching**: The process of obtaining data items from memory

Decoding: This is the process of translating the instruction into commands that the computer understand.

Executing: This is the process of carrying the commands.

Storing: This is the process of writing the results to memory. Is when the result of the instruction is written to its destination?

NB.Storage medium; physical material on which a computer keeps data, instruction and information for future use.

Storage capacity. The number of bytes (i.e. characters) a storage can hold.

Reading: the process of transferring data, instructions and information from a storage medium into memory

Writing: the process of transferring items from memory to storage medium

The processing speed: How fast information is processed depends on the type and performance of the CPU and within the CPU there is a device called the <u>clock</u> that controls the reception and execution of instructions given to the CPU and the faster the clock pulses, the faster the CPU, Hence the faster the computer can process data. **System clock**-this controls the functional speed of the processor .To determine the system speed

<u>**Ways Of Processing Data**</u>

Parallel processing: The use of multiple processors to execute a program at same time

Multiprocessing: The execution of more than one program by the same processor

Multiprogramming: The processing of two or more programs by the same processor at the same time.   **Batch [group] processing** -System in which data to be processed are first accumulated over a specified period of time and then processed as a group[batch]**<u>Special Purpose Memories</u>Buffers**. This is a region of memory that is used to hold data temporary while it is being moved from place to place.**Virtualmemory**Type of memory that supplement on the RAM space when the space of RAM is finished

and the computer still has data to process, (usually on the hard disk)

Cache memory. - Faster memory which help to speed up computer processes by storing frequently used   instructions and data.

- It stores copies of data from the most frequently used main memory. -Transfers frequently used information

Buffers-This is a region of memory that is used to hold data temporary while it is being moved from place to place

CMOS (complementary metal Oxide semiconductor)is memory used to store configuration information about the computer which includes amount of memory, types

of drives current date, time

-Store system setup

<u>**Ports And Connectors**</u>

Port: connects external devices to system unit. **Connector**: joins cable to

Peripheral **Power supply**: converts AC power into DC power. this is a path on the mother board of the CPU used to send from or to peripherals RAM and ROM

Bus: channel that allows devices inside computer to communicate with each other.

Bus width: determines number of bits transmitted at one time.

System bus: connects processor and RAM

USB: universal serial bus. Port that can connect up to 127 different peripherals together with a single connector type.

Expansion slot: an opening, or socket, on the motherboard that can hold an adapter card.

Parallel port: connects devices that can transfer more than one bit at a time, such as a printer
A serial port: transmits one bit of data at a time. Connects slow-speed devices, such as mouse, keyboard, modem

State the difference between an address bus and a data bus.
An address bus consists of all the signals necessary to define any of the possible memory address locations within the central processing unit, **while** A Data Bus (memory bus) is used to transfer instructions from memory to the CPU for execution.

Identify two ports used to connect peripheral devices to the computer. (any2x1mark)

☐USB port
- Audio port
- VGA port

☐Serial pin port
- Parallel port
- Ethernet

Plug and play -Peripheral device interface that can allow components to be installed, configured and used immediately without rebooting the computer [USB and fire wire]
Hot swappable -Interface that support devices that can be plugged and removed from the computer without shutting down the computer.i.e.while the computer is still running.(USB and Fire wire)

SOFTWARE COMPONENTS OF A COMPUTER
Software is a set of detailed step-by-step instructions, which enable the computer hardware to perform its assigned tasks
Computer software is sub divided into two main groups:
The Systems software [for the computer's self operations].
Programs that control the operation of a computer and its device

Programmers' that start up a computer and manage the general functioning of the system devices. Programs that enable hardware components to function.

Application software [for the end-user to perform a specific task on the computer].Programs that perform specific end user tasks. Programs that enable the user accomplish his task on a computer

NB. Software suit:-Is a collection of individual application software packages sold as a single package.e.g.ms processor

Examples Of Application

- All word processors: e.g. MS word etc
- All Spreadsheets: e.g. MS Excel etc
- All databases: e.g. MS Access etc
- Windows media player
- VLC
- All Games

Examples Of Application

Special purpose computers

→They are designed to handle only a specific task(s)

→A program that is designed and written just to solve the particular problem

General-purpose/off-shelf

→Designed to solve a wide range of problems, they perform a variety of tasks by means of specially written programs.

→They are pre-written general purpose programs purchased from the shop by the use

Advantages of off the shelf software over custom made.✓Relatively cheap

✓ They are easy to use.

✓ They are provided with extensive documentation to help the user.

- ✓ Compared to special purpose programs.
- ✓ They can be customized to solve other problems
- ✓ Have less error

Three categories of system software (3mks)
- ❖ The Operating system.
- ❖ Utility programs.
- ❖ Programming languages and Language processors

Utility programs

→These are service programs that are used to enhance the performance of the computer.

→Utility software helps to analyze, configure, optimizes and maintains the computer.

Examples of utilities

→**Sorting of files** These arrange data as specified by the user to locate them easily

→**Debuggers** remove errors in programs

→**Merging utilities** enable the user bring files together

→**Compressors** reduce file sizes for easy sending over a network

→**Defragmenters** bring file fragments together thus freeing space for the user to utilize

→**Back–up utilities:** Help in making duplicate copies of every file on either internal or external media as security files for reference incase the original copy is destroyed.

→**Data Recovery utility**: Used to "undelete" or resurrect a file or information that has been accidentally deleted.

→**Defragmentation utility** or "Defragger"

Used to find all scattered portions of files on the hard disk and reorganize them as contiguous files.

→**Disk defragmenter**: Whose contents have been stored on the hard in disjoined area and join them together to increase efficiency

→**Disk Repair Utility**. Checks your disk drive for defects and make repair on the spot.

→**Disk cleaner**. Can find files that are unnecessary to computer operation or take up considerable amount of space.

→**A disk checker**: can scan the contents of a hard disk to find files on areas that are corrupted in some way, or were not correctly saved and eliminate them for a more efficiently operating.

→**Data Processing Utilities.** Utility programs which remove redundant elements, gaps, and unnecessary data from computer storage space

→**Memory management utilities:** Are programs that determine how to efficiently control and allocate memory resources.

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→**Encryption**-utility use a specific algorithm to produce an encrypted stream or encrypted files when provided with a key and plain text

→**Merging Utility**: - Allows data from more than one file to be combined into one.

→**Copying/Backup**:- This allows the creation of a duplicate copy of the original.

→**Merging Utility**: This allows data from many files to be combined to make one file.

→**Antviruses.** Scan the computer to ensure proper functionality.

→**Anti-virus:** This detects and removes viruses from the computer.

→**Data compression:** Frees space on storage device (hard disk) by removing redundant data

Programming language.

→Are the artificial languages designed to communicate instructions

to machine, particularly a computer

→The means of communicating with the processor.(Computer).

→They can be used to create programs that control the behaviour of a machine.

→Languages in which local instructions are written for a computer to perform
  different tasks.

   →It is the logical flow of instructions in accordance to predetermined rule of
     grammar (syntax) of that specific language in order to form a program.

Four classifications of programming language

- Machine language
- Assembler languages
- High level language
- Four generation language

Categories of programming languages.

→Low Level Languages.(Machine code, assembly)

→High Level Languages.(3th,4th and 5th generation)

Low level language

These are binary languages that are closely related to the computer processor. They are written in binary format of 0s and 1s

Examples of low level languages Machine code/object code language/1st generation languages Assembly language/2nd generation language

Machine code: They are written in binary format 0s and 1s

→Very difficult to learn and very unfamiliar to humans

→Programming is likely to have errors

→It is easily understood by the processor

Assembly language. Languages those were made/invented to simplify machine code language

→It is easier to be understood and remembered by humans compared to machine language

→It uses few English abbreviation or words.e.g. SUB for subtract FNO for first number
→It is easier to understand than the machine code.

High level languages. Languages that use English words aimed at making programming much easier than before

Merits There were introduced as an improvement for assembly.They make programming much easier due to use of English wordsFewer instructions are written and others are automatically generated Less time is spent to write a lengthy program.

DemeritsCan be easily be understood by the computer processor

Categories of high level languages They are grouped into 3rd ,4th.and 5th generation languages.

Examples third generation language

   →Pascal
   →COBOL-common business oriented languages
   →BASIC-beginnersall purpose symbolic instruction code
   →FORTRAN-formulatranslation
   →Java
   →Visual basic
   →C.C+,C++

Fourth generation language

   →TheseHHL designed to make programming even easier.'
   →They consist of mainly predefined functions and procedures which need little customization
   →One doesn't need to know the details of the actual program codes
   →The code are generated automatically
   →The programmer only changes a few codes in order to come up with the program he wants
An example of 4GL is my structured query language (SQL)

   →Fifth generation languages
   →These are normally used in intelligence based systems such as robots
   →These languages manipulate facts and rules to reach a conclusion

→They mimic human action

→They are extensively used in artificial intelligence projects like in mars exploration.

Syntax refers to the spelling and grammar of a programming language.

LANGUAGE PROCESSOR

Programs used to translate HHL into LLL and back into HHL

Examples Of Language Processor

→**Compilers**it translate the entire high level codes to low level codes at once/at the time of compiling

→**Interpreter** translate a source program line by line while the program is running.

→**assembler:** these translate assembly instructions into binary code or machine code

→**Linkers**: these combine compiled programs and determine where the program will be located in memory

Use Of Computer Programming Language

Compiler-help to translate HHL code to LLL codes at once

Interpreter-helps to translate HHL to LLL in smaller bits

Debugger-helps to remove error in programming codes

OPERATING SYSTEM

A group of programs that manage all the activities on the computer .Be OS, Linux, Windows operating system etc.

The **operating system** communicates faults and detection of new devices.

The **O.S** is the coordinator of all system devices/resources.

Functions of the operating system

Give two considerations for one to choose an operating system.

→Computers specification e.g. memory capacity, processor speed, hard disk capacity etc.

→The type of computer in terms of size and make.

→The application software intended for the computer.

→User friendliness of the operating system

→The cost of the operating system

→Reliability and security provided by the operating system

→The number of users it can support

THE MAIN FUNCTIONS OF OPERATIN SYSTEM

→Memory management

→Booting the computer

→Providing the user interface

→Processor management

→File management

→Managing the storage

→Administering security

→Monitoring system performance

→Helps in configuring devices

→Scheduling computer

→Error handling

TYPES OF OPERATING SYSTEM
Desktop Operating System These run on desktop computers.eg.

→DOS→Windows 3x→Ms-Windows 95→Ms-Windows 98

Networking operating systems:-These are designed to be used on several computer that exist on a network

→Novell NetWare

 →Windows 3.11 (windows for workgroup)

→UNIX

→LINUX

PDA operating systems-These are designed for small devices and examples are

→Windows CE (windows compact edition)
→Palm operating systemPocket pc 2002

Other operating systems. Are **t**hose designed for specific computers?

→Mac operating systems (Macintosh computers)
→ARCONRISCOS (machines that use Arconprocessors)
→VMS for DECs mini computers
→System-7 for apple Macintosh computer
We can also Categorize Operating Systems as follows :
i. According to the number of users it can support simultaneously.
ii. According to the number of tasks it can perform simultaneously.
iii.According the user interface it provides
iv.According to the way or where they are used.
According To The Number Of Users

Single-User Operating SystemsMulti-User Operating System

AccordingTo The Number Of Tasks

Single Tasking

Operating System Or Single Program Operating SystemMulti- Tasking Operating Systems

According To The User Interface

Interface means the interaction between the user and a computer **Or** the way how a computer present it's self to a user, and the way how a user

responds to it.

The user interfaces include the following:

Command line interface (CLI) Graphical user interface (GUI)Menu driven interface

d).**Graphical user interface (GUI) operating systems** A type of user interface that allows users to interact with programs by manipulating graphics, along with a keyboard and pointing devices such as a mouse, to provide an easy-to-use interface to a program. GUI allows one to enter commands by pointing and clicking at pictures (icons) that appear on the screen. It allows the use of a mouse to click at icons or graphics on the screen. **Command-driven** Operating Systems lets the user type a command at a command prompt. The commands are executed after pressing the Enter key or the Return carriage.

Mouse-This is a hand held device that basically moves the pointer on the screen.

- Selecting text
- Drugging and dropping
- Navigating text by scrolling
- Confirming operations
- Used for drawing
- Used for sizing objects

- Susie
  Linux
  Novell Netware
  Apple Mac OS
  Linux

Examples of Operating systems which provide GUI include:-

- Windows 3.x
- Windows 95
- Windows 98
- Windows NT
- Windows 2000
- Windows ME
- Windows XP
- Windows Vista
- Windows me

DOS (CLI)	WINDOWS (GUI)

Requires little memory →More memory

Requires less disk space →More disk space

Not user friendly →User friendly

The user has to know the commands or Look them up

→ The commands are much more intuitive

The commands usually have to be entered in full

→Command shortcuts are possible such as <Ctrl> C to copy there are no graphics

→ Graphics are used to represent tasks, files etc. There are no menus

→ Menus are used for making choices and selections

The user has complete control

→The user choices are restricted to those on the menus

Commands have to be entered accurately with the correct spellings and syntax (rules)

→ Spelling and typing errors are avoided

No pointing device is used

→ A pointing device is used to select items and make choices

The interface is more difficult to use and the user is more likely to make mistakes

→The GUI is more user-friendly More learning and training is required

→ less learning and training by the user is required

State the difference between software upgrade and software update.
→Software update provides bug fixes and minor software improvements while;
→software upgrade is a purchase of a newer version of software with new features to
your current software.

Interface means the interaction between the user and a computer **Or**The way how a
computer present it's self to a user, and the way how a user responds to it.Give four
different types of devices that allow human being to interface with computer system
identifying how?

➢ Key board   ➢Monitor
➢ Mouse   ➢Projector

Shareware software:
→Application software that is given out to people to try it for a given time and pay for some after

→Copyrighted software that is distributed free for a trial period and payment required for using the software beyond that trial period

Firmware Also as stored logic is a combination of both the software and hardware recorded permanently on electronic chips.{usually Read- Only-Memory chip that is planted into the motherboard}

Open source: Type of application where users can be able to view the code source and make some modifications.

System update. Provides bug fixes and minor software improvement.

Software update Is a purchase of a newer version of software you currently use of a more fullyfeatured version of your current software.

Factors to consider when choosing a package
- User requirements > Technical requirement:
- Documentation > After purchase service\support:
- User-friendliness > Up-to-date
- Market confidence/performance of the > Modification
  package: > The cost of the package vs benefits

Freeware. Is software provided at no cost to users?
Interpreter. Is software that translates the
source program line by line while the program is running?
Basic. Is software that is used to teach junior programmers?
Single user license. A license agreement that gives a software buyer the right to use [install] software on a single computer at a time.
Site license.-Gives a software buyer the right use/install the software on multiple computers at a single site

Features that make GUI based OS user friendly

Windows
Menus
Icon
Pointer

MICROSOFT WINDOWS.

Microsoft windows had been described as a GUI. This is an interface in which almost everything is represented graphically.

It's an environment that enables one to:-

- Easily start up and work with applications.
- Run more than one application at a time.
- Transfer information between applications.
- Organize and manage files created in these applications easily.

PARTS OF A WINDOW. Most windows have all or some of these features.

1. **Control Menu Box.** Located in the top right corner of a window. It consists of the control menu which is activated by clicking on this box.
2. **Title Bar**. This stretches across the top of the window and contains the name of the application, document. On the right of the title bar, there are three tiny buttons namely:-
   3.**Minimize and Maximize Buttons and Close.** Located top right corner of a window.
   - **Minimize:-** reduces the window to the bar.
   - **Maximize:-** increases the window to fill the entire desktop.
   - When the window is maximized, the restore button replaces maximize button.

4. **Scroll Bars.**

These appear on the right and bottom of windows. These help to move the work area up and down if it contains more items. It cannot fit in the visible work area. Scrolling brings hidden items into view.

5. **Windows Borders.**

These are the perimeters which define the wonders work area.

The Tool Bars (Buttons arranged in a row).
Menu bar- provides a list of commands to manipulate a task.
Standard tool bar.Formatting tool bar.Status bar.
Work area- where a document is created.

WHAT ARE WORD PROCESSORS?A word processor is application software that is used to create, save, edit, format and print documents that contain text and graphics.

Examples of word processors include:

- ❖ Microsoft Word   ❖Perfect Writer
- ❖ Word Perfect*   ❖Text Editor
- ❖ Lotus Notes   ❖Professional Writer

- ❖ WordPro ❖Notepad
- ❖ WordStar ❖Word pad
- ❖ Lotus WordPro ❖Dos Editor
- ❖ Corel WordPerfect

Word processors are mostly used for the following purposes or functions

- ❖ Writing/ typing letters ❖Designing Curriculum vitae
- ❖ writing reports ❖Writing articles for books, magazines
- ❖ Writing books or newspapers etc
- ❖ Writing essays
- ❖ Making memos

Features of the program used to create this work.

↔**Thesaurus-**A feature that helps you find the meaning and other words that can be used instead of the one you want to use

↔**Drop cap-**A feature in MS that lets a letter to begin more than one line

↔**Foot notes -**A feature that helps you adds extra information on what you have written in your document it is put at the end of page.

→**Endnotes** are placed at the end of a text.

↔**Mail merge-**A feature that makes similar letters have to be sent to several people.

↔**Save as -**Is a situation when you're keeping/storing (saving) a document for the first time.

Saving. The act of transforming data/information from memory (rom) to the storage medium

Footer. Text that appears in the bottom margin of the page repeatedly

→Is text that is separated from the main body of text and appears at the bottom of a printed page margin?

→**Word wrap**- Word automatically starts anew line when you reach the end of the current line

→Allow a user to type continually without pressing the enter key at the end of each line

→**Formatting a text.** Changing the text appearance

→**Clip art**. In-built images in word processor library

→**Clipboard.** Temporary files used to store information.

→**A drop cap**: is a letter that begin more than one line

→**Water mark**: a text or picture in the background of a document

→**Indent**: the space between a page's margin and where the text begins .Generally the first line of a paragraph is an indent

→**Mail merging**- Enables similar letters to be sent to several people. The names and addresses of each person can be merged with one single standard document printed out.

→**Headers:** are words that are inserted at the top and will appear on every page

→**Character map:** Is used to enter special characters that do not appear on a keyboard

→**Indenting**: refers to the increase or decrease in the amount of space between the text and margin

→**Hyperlink.** Is a reference to data that the reader can directly follow, or that is followed automatically to a section within a page or entirely a new document or file.

→**Find and search.** Allow user to locate all occurrences of a particular character word or phrase

→**Replace :**Allow a user to substitute existing characters, word or phrase

→**Spelling checker** Allow a user to check and correct the spelling of a whole document at one line.

→**Grammar checker:** Reports grammatical errors and suggests ways to correct them

→**Automatic page numbering:** Numbers the pages automatically in a document

→**Tables: Allows** a user to organize information into rows and column.

→**Thesaurus:** Suggest alternative words with same meaning

Advantages Of Word Processor Over Type Writer

→A document can be stored on the computer for reference.

→They reduce on storage costs because the files on the computer do not occupy space like the paper files.

→Word processors are easier and more efficient to use because some actions are automated. For example the word wrap feature which takes the cursor to the beginning of the line once the current line has been used up

→They have special editing tools such as spelling and grammar checker and thesaurus that help the user to easily correct grammar and spelling errors. Thesaurus helps the user to find words with similar meaning.

→Word processors have superior document formatting features. For example, underlining, boldfacing, italicization, applying different colors etc. Formatting refers to

the art of making the document more attractive and appealing to the eye. Thus word processors can print work of better quality.

→It automatically corrects errors by the use of the spellchecker feature while typing

State two ways on how data can be emphasized?.
→By Boiling
→By Changing Font Colour

→By Underlining   →By Changing Text Direction
→By Changing Font Size   →By Changing Text Alignment

State one function of the each of the following in relation to data processing.
Spacebar. Provides a gap between words while typesetting. Used to align pictures.
Enterkey.
→Used to create a new line or paragraph.
→Used to force a page break.
→Used to confirm a command e.g. do you want to save this file?
Backspace -Deletes a
character to the left of the cursor
Delete-It erases a character to the right of the cursor
Scrollbar. Used to move a page left, right, top and bottom.
Num Lock-Activates or deactivates numeric key pad
Esc key
→Used to cancel an activity or operation
→To stop or pause a presentation
→Used to go back to the menu platform in games
→Used to go the start menu in a windows computer (Ctrl+Esc)
→Erase and get out of the spotlight menu
→Hide your browser cursor
→Reverse your "make this tab a window" drag
Save. Used to keep or store a document in a computer for future use. .
Drag. A pointing device gesture in which the user selects a virtual object by "grabbing" it and moving it to a different or onto another virtual object
→Involves in moving an item (file) by scrolling or click hold & move it to different direction

→Is a pointing device gesture in which the user selects a virtual object by "grabbing" it and moving it to a different location or onto another virtual object.

Copy. Involves in duplicating an item (file

Teachers of the other school use typewriters for all letters and forms. The school has decided to introduce word processors to make office work more efficient in term one of next year. State five reasons as to why this change may worry some office staff.
- Technophobia/techno stress
- Loss of jobs say for messengers in cases of networking
- Health issues for eye defects, back pains, etc
- Fear of Cost of retraining or learning new skills
- Fear of increased electricity and subscriptions costs
- Fear of computer related crimes like forging of documents
- Fear of loss of man-hours through computer games and playing games and videos during working hours
- Data loss by viruses and systems crashing ☐Computer related errors and accidents.

State two advantages of mail-merge as used in a word processor.
→Saves one of typesetting the same documents for deferent recipients.

→Guarantees accuracy since names of recipients are picked from the database.
→Uniformity of the wordings is assured since it is the same letter one sends to different recipients
→It can be harnessed for other purposes e.g. report generation and billing.

The mouse: This is a hand held device that basically moves the pointer on the screen.
Types of miceMechanical -This has a track ball on its underside to detect movement of the mouse

Optical-This uses devices that emit and sense light to detect movement of the mouse

Cordless (either mechanical or optical)-This transmits data using wireless technology such as radio waves or infrared light waves

Mention two functions of a mouse.
- Move the cursor on the GUI.
- Manipulate a computer game.

- Draw objects like a rectangle.
- Used to control music players by clicking.
- Used to scroll the page.

Distinguish between clicking and dragging as used in relation to mouse operation.
Clicking refers to the pressing the primary key to issue a command to a computer, **while,** dragging is any operation in which the mouse button is held down while the mouse is moved.

Give two advantages of using a mouse over keyboard
-Easy selecting of items or move to a particular position**-**A trackball mouse is good for limited desk space .user does not need to move the entire device   **-**Better for diagram drawing

Name any two standard keyboard layouts
- QWERTY
- GKOS
- CHORDED with very few and integrated keys
- American standard layout
- British standards layout

Mention any three parts that make up the keyboard.
→**The Typewriter Area (Main Typing Area):** This is used for text data entry
→**The Numeric Keypad**: This is made of numbers to simplifies numeric data entry
→**Cursor control key**. This is made-up of arrows to moves the cursor in all directions
→**The Function Keys area**: This is made up of specialized keys each performing a specialized function according to the operating system used

State one use of a computer keyboard in data processing
→Used to enter text into a computer
→Used select data
→Used to enter an instruction during data processing
→Used to align objects during data processing

Okello deleted his file accidentally. In which two ways can he recover his file?
By pressing **ctrl+z**

By clicking on **undo**
Opening the recycle bin and **click on restore**

What is the difference between word processing and spreadsheet application?
Word processor involves editing text based documents like letters **while** spreadsheet involves calculation

Features of SpreadsheetWorksheet: A component where data is entered. In Excel.

Row: is the horizontal arrangement labeled 1, 2, 3…

A column: is a vertical arrangement of cells labeled A, B, C…

A cell: an intersection between row and a column

Formulae Is a mathematical expression used to solve mathematical problem .must begin with equal sign

(=)**Functions.** These are inbuilt predefined formulae that the user can quickly use instead of having to create a new one each time calculations are to be carried out.

Worksheet: - Is a grid of columns and rows. It is a component in which data values are entered. OR A single work space in a spreadsheet

Workbook: This is a collection of worksheets grouped together. OR Collection of work Sheet

Relative referencing: A cell address that changes as the formula gets pasted to other cells

Absolute referencing: A cell address that does not change as the formula gets pasted to other cells. A formula where a cell reference remains fixed when copied.
Labels. Any text or alphanumeric character entered in a cell.
Values. Numbers which can be calculated mathematically

Types of data stored in a spreadsheet

→Labels/Text.

→Numbers.

→Formula

Apart from calculations, give other two functions of excel

→It carries out a variety of tasks like

→Financial planning, budget,

→Cost projections,

→Cost planning,

-budgeting, producing invoices etc

→It can present numerical data on charts

→They have the aspects of speed, accuracy and efficiency which enable the user to accomplish tasks quickly

→They enable the user to produce neat work because there is neither pencil, rubber, nor whitewash which always made the work dirty.

→They have better document formatting capabilities like colors, charts, and illustrations which can make the work beautiful

List any one unique feature of a word processor and spreadsheet

→Watermarked, mail mergeVs formulae, and functions

Explain The Meaning Of The Following Spreadsheets Cells Error Messages

#NAME? This will appear when you have entered a wrong formula or some text in the formula is not recognized

###this will appear when the data entered in the cell is wider than the size of the cell.

#NUM! This appears when a formula or function has a number that has problem in it

#REF! This appears when a there is poor cell referencing

#N/A! This will appear when the value for the formula or function is not available.

#NULL! Error value occurs when you specify an intersection of two areas that do not intersect.

#DIV/0!Error value occurs when a formula divides by 0 (zero).

#VALUE! Error value occurs when the wrong type of argument or operand is used

PRESENTATION SOFTWARE Applications' software thatis used to enhance the communication process with the use of visual aids like presentation slides.

Examples

- Microsoft PowerPoint.
- Harvard Graphics
- Lotus Freelance.
- Micrographics Presenter

- Corel Draw
- OpenOffice Impress
- Adobe Persuasions

Uses of Presentation Software

- Reduces boredom- interesting graphics.

- Help to present and illustrate an idea in quality and different way- photos, videos, animations and diagrams e.g graphs.

- It can be linked to www and distributed.
- Teachers can use it to supplement on the teaching aid.{can present pictures of the hard to get machines or animals}
- Learners can use it to present their research work to their trainers
- Can be used for advertisement e.g. in business show rooms, into box in super markets **Disadvantages of presentation software**

- Light control might not be possible in some rooms. Sometimes its too dark and at times too much light.
- Technology may break down in the middle of the presentation.
- The teaching does not become adaptive and reactive.
- It depends on the skills and creativity of the presenter.

Microsoft PowerPoint
→this is a collection of electronic slides that can have text, pictures, graphic, table, sound and video. This collection can run automatically or can be controlled by a presenter

Examples of power point software

- Open office impress
- Corel draw
- Word perfect

Features of power point

• Designs	• Hyperlinks	• Slides
• Animations	• Sounds	• Charts
• Transitions		
• Videos		

Slides:

single page in power point which is part of the visual presentation file. . It's the working area equivalent to a page in word document. Slides are put together to form a file or presentation.

Presentation:

the entire work done referring to a particular topic or it is a single saved file made up of a series of slides and objects such as audience handouts

Template

Predefined inbuilt format and color scheme to be applied to a presentation/ it is file already created and stored in the computer for reference purpose.

Animation Visual effects applied to individual items in a slide (images, titles or bulleted points)**. [Putting monitor and or sound to various objects in your slides]**

Transition: this is the visual movement in a given slide show. It is a method of moving one slide off the screen and bringing on another onto the screen during a slide show. Move/switch from one slide to another.

Master slide

→Apparent slide that contains text and objects that will appear on all other slides (such as headers &footers, slide numbers, date & time)

→Is a special slide that once designed acts as a template for the rest of the slides in the show? Its features can be applied or used in all other slides

Terminologies Sizing handles: - Six boxes that enclose a selected object; these may be six or four depending on the size of the object.

Presenter: - A person who delivers a presentation XYZ Speaker.

Audience: - Individuals who have an interest in the presentation.

NormalView. Used to work on all slides detail in a presentationHas 3 major sections i.e.

- The outlines pane
- The slides pane
- The notes pane

Guidelines forA Good Presentation

- ❖ **Simple and readable**: Make sure you prepare a readable presentation and avoid putting many words on the slide
- ❖ **Avoid reading the information**: let the slides just supplement on your presentation. Make preparation early. You should not prepare your presentation in front of your audience.
- ❖ **Follow the speech rules**: make your communication loud, face the audience and other
- ❖ **Make your presentation entertaining**: use good animation, clip arts that can entertain the viewers
- ❖ **Use diagrams where appropriate**.
- ❖ **A good title slides attracts an a audience's attention** and tells them about & how the speaker is going to approach it
- ❖ **Avoid excessive use of slide transition and animation**
- ❖ **Include only one the main points**
- ❖ **Establish a uniform single look for the presentation**
- ❖ **Identify the goal of the presentation**

Advantages of power point

- • Less expensive in terms of printing medium (paper)

- Easy to prepare
- Easy to edit
- Interactive during presentation
- Interesting due to its animations and transition design

WHAT IS A DESKTOP PUBLISHING

Is used to design and produce artistic/complicated documents that contain text, graphics, and brilliant colors.

State two features of desktop publishing application programs.

Page layout, this enables arranging text and graphics on a page-by-page basis.

Color libraries to ensure that colors will print exactly as specified.

Master copies used duplicate design features to all pages in a document.

Frame: areas within a publication which may include text areas and picture area

Handles: small circle which appear round the edge of a frame when you click on the frame

Template: tools having pre-chosen design styles that can be used in publisher to help you easily create basic publication

Master page: is a publication page with the design and layout elements that are repeated on multiple pages

Ruler guide: is used to mark precise positioning of objects

Margin guides: are found on the sides, right, left, top, and bottom of the page and used to define margins.

Base line guides: are used to align text to provide a uniform appearance between columns of text.

A paste board: is a large black region outside the printable area where objects are stored before being arranged in the printable area.

Give two examples of desktop publishing application programs.
- Microsoft Publisher.
- Adobe PageMaker.
- Adobe InDesign.
- QuarkXpress.
- iStudio publisher
- Corel draw
- Frame maker
- Broderbund Print Shop Pro

MICROSOFT ACCESS

Is a program to create and manage databases?

Starting DBMS (MS-Access 2007)

i. Click start button
ii. Point to programs
iii. Click the Microsoft Office Folder
iv. Click MS-Access 2007 (MS-Access screen appears)

The Data Base

→Is a collection of logically related data or records?→It's a collection of interrelated data about a particular subject or for a specific purpose which allows a user to retrieve, updates and manipulated data anything

Data base management system/software (DBMS)

→Is a collection of programs that enables users to create and maintains the database
→This is software which allows a user to create, access, and manage a database.
→A program which lets a user manage information in a database

Examples of Database Management System

Microsoft Access	Visual basic
Oracle	Dbase V
My SQL	ForPro

Function of DBMS

➢ It provides an interface for a user to enter data
➢ Enable the creation of summary report
➢ It enables users to create forms for input and display of data in a graphical user interface
➢ It helps organize data in a way that allows fast and easy access to the data **Components**

   of data base management system environment

➢ **Hardware:** They can range from PC to a network of computers
➢ **Software:** DBMS (such as oracles, MS Access, Visual basic), operating system, network software and application programs
➢ **Data:** Raw facts used by an organization and description of this data called schema
➢ **Procedures:** Instructions and rules that should be applied to the design and user of the database of DBMS
➢ **Users:** The people who use the DBMS such as a database administrator's programmers and users.

There are mainly two types of databases;

→Manual databases →Electronic databases.However, Electronic databases are today commonly used.

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Manual databases

These are non-computerized. These are traditional ways of recording and keeping data using simple devices e.g. a book with a list of items in stock, a diary e.t.c.

However, these methods/databases (manual) had /have problems/weaknesses.

- Poor update of records
- Time wasting (when searching for particular item).
- Unnecessary duplication of data
- Misleading reports due to poor entry and organization.

It's these weaknesses that led to the use of DBMS

Electronic databases

These are computer based databases. They are further categorized into Distributed database, which sit on individual stand-alone computers and centralized databases, which sit on a database server.

Advantages of electronic databases over manual

- Enhancement of data integrity because it is centralized, fewer updating errors occur and greater accuracy can be maintained.
- It is easy to enter and retrieve data in a short period of time
- Database stores data that is consistent and reliable since at each stage ,it is checked Can store data for a very long period of time say 20years and so.
- Flexible since it can be redesigned, to hold thousands of data
- A database can be used by many people at the same time
- Data is frequently updated after each single entry
- Data is automatically saved as soon as data is entered into a database
- Data can be retrieved in different formats e.g.query, forms, report etc
- Reduction of data redundancy – storing data in one place means less duplication and less space is required for storage
- Centralization of security – it is easier to limit access to information it it is grouped together instead of being kept in several scattered files. Most databases must be protected and kept private.
- Reduction of costs – data entry, data storage, and the development of new application programs are all made more economical by eliminating the duplication of data, organizations can realize substantial savings.

- Convenience Data backup
- Efficiency Confidentiality
- Accuracy Data consistence
- Data security Easy administration

⬜

Disadvantages of Electronic Databases

- Difficult to develop
- Expensive to manage.
- Require highly-trained expertise for maximum management.
- Data security may not be ensured in case of data sharing.
- Data can be pirated or corrupted by unscrupulous data managers.

Functions of Electronic Databases

- Allow the user to add and delete records ⬜Update or modify the existing records.
- Organize data for easy access, retrieval and manipulation of records.
- Act as an interface between a database and other application programs.
- Ensure security for the data in the database by safeguarding at against unauthorized access and corruption (damage)
- Keep statistics of data items in a database.
- Data storage; it keeps the statistics of data items in a database
- Enables easy data sorting
- Eases data update and modification of existing records
- Enables easy making data summary

Characteristics of a good database.

- It should make efficient use of computer resources
- Be updateable
- Provide easy access to authorized users -Preserve data integrity.
- Ensure the privacy of data

Advantages of using DBMS

- Reduction of data redundancy. Less duplication of data and less space required.
- Data sharing and integration: the ability to combine data in many different ways.
- Improved access to data: It allows to query the database directly.
- Reduction of costs: many organizations can realize substantial savings.
- Data integrity: fewer updating errors occur and greater accuracy can be maintained.

Disadvantages of DBMS

- They are difficult and time consuming to develop
- They are expensive to setup
- Data can be destroyed easily
- It requires trained personnel to use it. **Examples of typical data bases**

- ➢ School register
- ➢ National voters register
- ➢ National passport register
- ➢ National population and housing database
- ➢ Mobile phone subscribes data base
- ➢ Address books

Data bases can be categorized into two:

i)Flat File database
ii)Relational Database.

i) A Flat file database is made up of one table.
ii) A Relational database can take information from two or more database tables and combine them into a new table or report.

Relationship: This determines the way the detail in a table is related to the details in another table.

Data Validation: This is the checking of input data for errors before processing.

Data Normalization: This means minimizing any data duplication as far as possible.

Data Redundancy: Data is often repeated in more than one file. When dealing with monetary value such as fees balance, amount sold. **Validation rule**.

→Gives an expression that must be true whenever you add or change a value in a field.e.g. "F" or "M"

→Is a method used to check that data falls within the appropriate range or parameter defined by the database user

→Logical expression that restricts the values to be entered in a field.e.g.,if you want to restrict marks entered in a field to values between zero and a hundred, type >=0 And<=100.

Caption: a more descriptive name for a field to be used in a table or a form display.eg.the caption for **StuName** could be Student Name

Input mask: input mark automatically formats the field entry into a specified format.(mostly used to format phone and address entries

Validation text is a text that appears when a value violates the validation rule.e.g. Required to enter F or M for this field

Description of data types (the top pane properties)

Data type: Is the type of value that will be entered into the fields. These include

- ➢ **Text:** e.g. alphabetic letters, numbers, spaces and punctuations. Any combination of letters and numbers
- ➢ **Number**:   numeric numbers 0 – 9.

- ➤ **Memo**.Theseare whole sentences of up to 32,000 characters in length, including spaces. It used instead of text if one wants to enter many paragraphs of text in the field
- ➤ **Data/Time**: used to identify a field as date or time. or both
- ➤ **Currency**:   used to identify numeric values that have decimals or fractions.
- ➤ **AutoNumber**: a value used to automatically increment the values in a field.
- ➤ **Yes/No**:a logical field where an entry is True/False, Yes/No, etc
- ➤ **OLE Object**. **(Object Linking and Embedding)** Used to insert objects or graphical objects. AnyObject is a sound, picture or other object such as a word document or excels spreadsheet that is created in another program. Use this data type to embed an OLE Object or link to the object in the database.
- ➤ **Hyperlink:** A hyperlink will link to an internet or intranet site or another location in the databse.The data consist of up four parts each separated by the hash key.

Common words used in MS-Access Keys in database.

i.   **Primary key:** A field or combination of fields that uniquely identifies each record in the table.
ii.   Used to uniquely identify a record in a table

Note that: the primary key cannot be the same for two records. This field can never be blank.

Qualities of a primary key field:
- ✓ It does not accept null (zero) value
- ✓ It cannot allow duplication of data in this field.

Mention three characteristic of a good primary key

- ✓ It uniquely identifies each row
- ✓ It is never empty or null –there is always a value ✓It does not allow duplication values.

iii. **Foreign Key:** A copy of the primary key in another table. Field that related to the primary key of another table
iv.   Used in one table to represent the value of a primary key in a related table.
v.   **Composite key:** This is a primary key that is comprised of two or more fields. It can also be called a compound.

Table: Sometimes called database entity.. It's made up of rows and columns used for storing data.   So a group of related data organized in fields (columns) and records (rows) on a datasheet. Or Collection of related records
Collection of data about a specific topic

Creating a table Design

1. Activate the create tab
2. Click **table design** in the tables group .access changes to design view and the table tools become available

Table design allows you to define the fields in the table before adding any data to the data sheet The window is divided into two parts. A top pane for entering the field name type and an optical for description of the field and a bottom pane for specifying field properties.

Forms: These are screens for data entry.
Report: These are requests for summarizing data in tables for easy reading
A record: is a row on a data sheet and has a set of values defined by the field. Each record contains the data for one person as specified by the intersecting fields.
A field: this is a column on a data sheet and defines a data type for a set of values in a table.
Boolean: This is a logical field where an entry is **yes** or **no, true** or **false.**(E.g. if a field require you to answer whether you are a male or female.

Query: Is a question or a request to the database

Field Name: These are different categories within a table and should represent the contents of the fields such as First name, Last name, Sex; Age etc

State two advantages of using an electronic database over a manual database.

→It is faster than traditional means of sending messages.

→It guarantees message delivery and gives feedback when the message arrives.

→It is cost effective since most of data communication tools like E-mails are free.

→It is secure since it is protected by passwords and does not pass through people's hands.

→It is convenient since messages can be sent at any time of the day.

Forms of normalization rules
First normal form: it states that at every row and column intersection in the table there exists a single value, and never a list of valves.
Second normal form: it requires that each non-key column be fully dependent on the entire primary key. Not on just part of the key. This rule applies when you have a primary key that consists of more than one column.
Third normal form: it requires that not only every non-key column be dependent on the entire primary key. But that non-key column be independent of each other.

Precautions For Designing A Good Database Table

→It should have a primary key

→Should have formats and required data types

→Should have the required number of records and fields

→Each field name should be adequately described to enable future updates to the database

→The database should at all times avoid data redundancy I the table

→All large tables should be separated into small tables that can be related to enable the database to update and run very fast

→Should have required validation rules and texts for the table for proper interaction

→Should be designed in order to allow future expansion of the database

→Should satisfy the form normalization rules

Take an example of this field name and data type

Field Name   Data Type

ID Number   Text

Last Name   Text

Married   Yes/No

First Name   Text

Student Number   Text

Car makers and model	Number of cars sold	Air conditioning
BMW series x	20	Y
Opel Corsa	11	N
Nissan Micra	54	N
Ford mondeo	09	Y

i).Which field stores Boolean Data?

→Air condititioning

ii).Give reason why Boolean data type is used

→It is used to answer questions where there are exactly two alternative/options

→Because it holds data that is either true or false

v). which field stores numeric data?

→Numbers of cars sold.

iii).Give one reason why numeric data type is used

→This allows a whole number or a decimal number

→Only numbers can be entered, no letters or symbols

→Calculation can be done.

iv).Identify one other data type used in database above.

→Text data type (number of cars sold)

→Forms in database. These are used as alternative way to enter data into a data base table.

A report in database. Report will organize and group the information in a table or query and provide a way to print in a database.

A **detailed report** displays all of the selected records. You can include summary data such as totals, counts and percentages in a detailed report. A summary report does not list the selected records but summaries the data and presents totals, counts, percentages or other summary data. Access has several reports generation tools that you can use to create both detailed and summary reports quickly. Reports can be created using wizard or design view.

Creating a report in design view

1. Create
2. Report wizard
3. Click on >>symbol
4. Next (up to **what title do u what for your report**)

5. Then click on modify reports design
6. Finally click on **finish**

Creating a Query in Query Design

OR

i. Create
ii. Query wizard
iii. Ok
iv. Click on >>symbol

v. Click next
vi. Click on details (showing every field they record)
vii. Click Next
viii. Modify the query design ix. Then finally click on **finish**

The tables below provide examples for some arithmetic operators and wild card symbols used

EXAMPLE	EXPLATION
>20,000	Values over 20,000

>=1	Values greater than or equal to 1
<100	Values less than 100
<=3000	Values less than or equal to 3000
<>"FL"	Not equal to (all states beside floride)
Between 1 and 10	Numbers between 1 and 10
Is null is not null	Finds records with no value or all records that have a value
>0 And <=10	All numbers greater than 0 and less than 100
"Bob" or "Jane"	Values are Bob or Jane
"a*"	All words beginning with A

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*th	Asterisk represents the wild card that end in th e.g.25th
*z	All words ending with letter Z
K*H	Find any record that starts with letter K nand end with H
MP	Any record that has "mp" anywhere in the field.
*/2016	Find all dates in 2016
3/*/2016	Find all dates in march 2016

Agg: datedeff ("yyyy", [DOB], now (),)Between #2/5/1979 and #3/4/2000#Under age; year (now ())-year ([DOB])

THE INTERNET

→Is a worldwide collection of networks linked together →A collection of local area networks joined together to form a single global networkIt is a worldwide system of interconnected computers. The internet is not a physical thing. It is just a technology for getting all kinds of computers to communicate with one another and exchange data. These standards or rules which control the transfer of data and communication between computers are called **Internet Protocols (IP)** TCP/IP is the set of rules that govern computers to communicate on a network including the internet.

Things one would require in order to get connected to the internet

- ❖ **A computer**.
- ❖ **NIC**-Network Interface Card.
- ❖ **Modem**- Acronym for modulator demodulator. An electronic device that attaches to a computer and links that computer to the internet through a telephone link.
- ❖ **A physical connection** such as telephone line.
- ❖ **An internet service provider** (ISP) to supply the internet. ❖**Internet software** - e.g. protocol to make Pcs compatible, ❖Operating system enable configurations. **Use of the internet as a learning tool**

- • To search for information using search engines and directories
- • E-mail system is used in collaborative learning
- • Enables distance learning
- • Discussions over educational chat rooms
- • Enables downloading of relevant documents
- • Computer Assisted Assessments (CAA) for online exams
- • Use of electronic libraries and textbooks
- • Assignments are received, done and sent across the network by the students
- • Video conferencing is used to share views and ideas among students and teachers.

Merits of internet in schools

- • A lot of information is obtained which is not available in a single textbook
- • Updated or current information is obtained since internet is dynamic
- • Learning is fun and easy as internet is exciting due to the multimedia content used. ▢It offers different sources of information hence a Varity of opinions on a topic
- • It's a quick way of getting information where internet connection is good
- • It encourages group work through collaboration therefore sharing of information and experience among students and teachers
- • Students are able to attend virtual classes
- • Different skills such as typing, use of web browsers, problem solving-mail are developed through the use of internet
- • Instant or timely communication is done by use of the E-mails system

- Shopping for item such as books is made easy and less expensive

Disadvantages of the internet in schools

❖ No information control over the internet such that all sorts of bad information is accessed
❖ There is no privacy of information and information piracy is common
❖ Indecent material is published on the internet
❖ It's not readily available to most people
❖ It is expensive and its access drains school resources
❖ Time is lost where internet speed is low due to poor links, hardware and congestion.
❖ Some sites give outdated therefore misleading information because they are not regularly updated.
❖ Time wasting occurs when students easily stray into non essential material
❖ Many internet sites have been commercialized
❖ Computer viruses are easily spread over the internet
❖ Difficult to obtain information relevant to a particular level of a student
❖ It is possible to obtain contradictory information
❖ Many students and even teachers do not have adequate skills of accessing the internet.

Functions of the Internet

- It enables the receiving and sending of electronic mails around the world. These mails are delivered instantly around the world.
- Downloading programs and other files from other the world
- Net banking (internet banking). This has replaced the conventional way banking.
- Now you can bank at any time of the day and in any place where you have an account.
- Enables online education- internet enables students to study from their areas.
- This has facilitated long distance earning. Students can now not only register and attend classes but also do examinations online.
- On-line employment system with job seekers can register and obtain information on vacancies with/from various companies e.g. data entry.
- E-Library (E-books) - Internet allows access to current and up-to-date reading texts, for instructors, teachers and students.
- Journals and Research literature- Internet allows one to have access to libraries and databases. A researcher therefore is able to review numerous journals and relevant up-to-date literature.
- Joint Research- Internet increases co-operation efforts in selected joint research project of common interest especially on basic technology e.g. use of telematictechnologies in the field of telemedicine in the fight against major health scourges such as AIDS.

- News and information- Internet allows you to headlines and in-depth stories on everything as it/they happen. This is can be on politics, technology weather vagaries e.t.c. it's a virtual treasure of information. Any information on any topic under the sum by use of search engines.
- Newsgroups- News groups or electronic discussion groups allow people to discuss and exchange information on a vast array of topics.
- Finding people and organizations.
- Leisure and entertainment.
- Health- daily news about health care as well as a number of health resources.
- Shopping- Many online stores and sites that can be used to look for products and buy them using credit card. No need to leave the house.
- Online chat - makes new friends and meets new people and stay in touch with old ones.

Disadvantages of the Internet

- Pornography- This is a serious issue concerning the internet especially when it comes to young children. There are thousands of pornographic sites on the internet that can be easily found and can be a determinant to letting children use the internet.
- Moral and Cultural effects- cartoons and networks which facilitate access to pornography and other negative morals which has made fight against several problems of HIV/AIDS, bad sexual behaviors, drugs more complicated.
- Spamming- Sending of unsolicited e-mails in bulk which serve no purpose and un necessarily clog up the entire system.
- Personal Information- If you use the internet, your personal information such as; name, address etc. can be accessed by other people. The credit card information can also be got if at all it's used to shop online. This is akin to giving a blank cheque
- Ill Health- People who spend a lot of time of sitting in front of a computer. Radiation emitted by computer's screen is harmful to eyes. Sitting for along time is also harmful to the spine.
- Addiction - Some people can't just live without it. They have no real friends and when internet is down, they get furious. They live sedentary life styles.
- Costs- The initial costs of buying network hardware and software in addition to employing experts to do the work is very high.
- Virus- A virus is a program that disrupts the normal functioning of your computer system. Computers connected to the internet are more vulnerable/prone to virus attacks and they can end up into crashing the whole hard disk, causing undesirable effects.
- Spread of terrorism and drug trafficking- provides a rich recruitment for all illegal activities because of ease in communication.

Outline three factors which determine data transmission speeds over the internet

- The speed/type of the modem ☐Distance from the central office.
- The quality of the phone line used.
- The amount of traffic on the internet/ number of users online..
- The power of the computer (processor speed).
- The software used (Browser or Operating system).
- The ISP-they may have too many modems without enough bandwidth
- Satellite – For those who use the satellite face different several problems, wind, rain, cloud cover, solar flares, satellite dish, poorly configured bandwidth. **Mention services provided by the internet.**

- The world wide web
- E-mail
- Newsgroups
- Message boards
- Mailing lists
- Chat rooms
- Instant messaging
- Internet telephony

- Videoconferencing
- Gopher
- E-commerce
- E-learning
- Internet fax
- Health information on the net
- Music and entertainment
- Telnet

Advantages of using cell phone for internet access

- Portability
- Readily available
- Cheaper to use

- Immediate contact is possible
- Offer faster connections
- Time saving than crowded cafes

Disadvantages

- Can easily be lost
- Limited display of contents
- Large amount of data may not be downloaded

☐Some phones can't browse certain websites

Factors that leads to a slow internet download speed.

- Quality of ISP.   ☐Age and type of the network ☐Age of computer set. infrastructure used.
- Weather.
- Type of browser being used.
- Many pictures, animations, sounds and graphics on the page.
- Distance from the broadcasting device.
- Length of cable being used.

Netiquette

→Behaves shown when on a network/internet

→This is a set of rules and customs that is considered polite when communicating on internet

Give three ways how you can exercise netiquette.
- .Helping those seeking for answers on line.
- Log off your account after use.
- Never to search or post pornographic material (etc)
- Identifying yourself truly on internet
- Avoid clogging internet with unnecessary downloads and uploads. ☐Avoid posting rude statements on line
- Avoid hacking into people's sites or information.
- Respect for other people's views, resources and time while online
- Control spread of virus
- Respect of human dignity
- Do not use the internet to insult or abuse others
- Never to use the internet to spread lies

They involve the following practices
- →Helping those seeking for answers online.
- →Signing out your account after use.
- →Never to search or post pornographic material.
- →Identifying yourself truly on internet
- →Downloading only necessary files in order to avoid clogging the internet.
- →Posting polite statements on line
- →Respect for one's site and information.
- →Subscribing to only sites you have researched on.
- →Never to search or post pornographic material.

Netiquette for an e-mail service

♠Give the title/ subject of an email you are sending.
♠Greet the recipient of the message.
♠Write your message in sentence case not all in capital.
♠Identify yourself truly to the recipient.
♠Use proper sentence structure
♠Make sure your e-mail includes a courteous ending.

Netiquette for online group discussion

√Identify yourself with a name or handle
√Give objective comments
√Avoid bad language and have respect for other members
√Keep the discussion on the topic available don't divert others

<u>What is an e-mail address?</u>

Unique name that consists of a user name and domain name that identifies the user.e.g
mugisafred43@yahoo.com

Parts of an E-mail Address

- **Username;** for example Fred is a username in the email address fred@yahoo.com. It identifies the owner of the address.
- **@;** A symbol is read as'at'It separates the username from the other parts of the address
- **Server name;** for example yahoo in the address fred@yahoo.com. It indicates that the server computer that hosts the e-mail address for fred is yahoo. Other e-mail hosts or servers include Gmail by Google, hotmail, breakthrough
- **The period (.);** This is read as 'dot'. It is used to separate different parts of an e-mail address.
- **Domain name;** for example com, identifies the type of institution offering a particular service. For example com, co.uk, ac.ug, sc.ug and others. Some common domain names include:

Example / parts of an Email address
Ugandan_teachers@yahoo.com

- Ugandan Teachers – user name
- @ (at) – Separator of user name from domain
- yahoo - the domain name (mail server)
- . (dot)
- com - indicates the type of organization

try out this:owenfred@gmail.com**.**

Explain The E-Mail Format Below

Subject: carries the topic/theme/title/reason for the e-mail message

To: carries the e-mail address of the recipient.

From: This part carries the sender's e-mail address

CC: Enables copies of the E-mail message to be sent to the third party while acknowledging/showing other recipients.
Where other addresses to receive copies of the same message are indicated.

BCC: Enables copies of the e-mail message to be sent to the third party without acknowledging/showing/letting any other recipients (if present)

Forward: This enables one to send the received mail to another or other persons

Delete: This part enables one to ease the e-mail.

Compose. Is where one types the actual message?

Attachment: is a file /folder that can be included as part of your email message.

Terms as used by e-mail account users.

Inbox: Stores messages that have been sent to the E-mail account holder

Sign out: Helps in safely logging out of the e-mail account

Electronic -Mail: is the transmission of message via a computer network or internet

Advantages of electronic mails;

→Reduces paper costs

→Provides immediate delivery feedback.

→They offer provision for attachments.

→Secured by passwords.

→E-mails can be conveniently sent to multiple recipients.

→There is a possibility of multimedia mails where they can be received as voice mails and read aloud.

→Can easily go across many time zones (continents).

Disadvantages of electronic mails;

→E- mails introduces viruses

→E-mail is not secure i.e. snoopers and hackers can read it as it tallies along in the public ways that make up internet. In order that this problem is solved an Encryption code can be used. An Encryption is a software that scrambles the mail so that only those with proper encryption key can read it

→E-mails are not very private through tapings

→System overloads can cause unnecessary delays

Advantages Of E-Mail Over Ordinary Mail

→A message can be sent anywhere in the world at the price of a call without having to leave your seat. →Speed of delivery. The message will arrive in few minutes and can be picked up the next time recipe ent looks at their e-mail.

→Ability to send multiple recipients. The message can be sent simultaneously to a group of people.

→ It is easy to send a reply to an e-mail as soon as it is received using a "reply" button.

→Large files such as spread sheets and graphics can be sent as attachments.

→An e-mail address is universal and ordinary mail, one has to change addresses wherever he or she is located.

→Assurance of whether the mail has been sent.

→Convenient when retrieving and delivering messages.

→Some e-mail addresses are given free of charge. It is also free to send e-mails over the internet. Some servers like yahoo do not charge the sender.

→E-mails are more secure than the snail mail since it is only the owner who can access the inbox. They are password protected and they remain secretive unless the owner reveals it.

→The messages can be received anywhere anytime especially now that e-mails can be accessed on phones

→E-mails can be sent to multiple recipients simultaneously at the same cost or no cost at all

.→It is a very efficient method of sending messages over long distances and to many people in a short time.

→They are time saving for example one can travel abroad as the paper to present is being prepared at home and then later be sent to him instead of delaying in the name of waiting for it.

→Very easy to send a reply as soon as it is received by using the reply button

→No transport costs, no stamp costs,

→Assurance on whether the mail has been delivered is always given as soon as it is delivered

Disadvantages of <u>post office mail</u> and <u>electronic mail.</u>

- ✓ Delays on delivery in post
- ✓ E-mails work with power
- ✓ Some virus can be sent with e-mail
- ✓ There is a chance of altering the information in email
- ✓ There must be some content of constant network hence expensive
- ✓ Must be working with people with e-mail address
- ✓ Some e-mail address are given free of charge and no monthly fee as it is in post number
- ✓ Efficient and cheap method over long distance
- ✓ Easy to send a reply as soon as it is received by using the reply button
- ✓ Only those with internet connection can be e-mailed and those with e-mail addresses
- ✓ Some e-mail address are given free of charge and no monthly fee as it is in post number
- ✓ Efficient and cheap method over long distance
- ✓ Easy to send a reply as soon as it is received by using the reply button
- ✓ Requires some skills to be usedInternet connection and service is still expensive in some countries especially the developing countries
- ✓ They increase personal insecurity because the network can be hacked into and the communications be tapped (eavesdropping) into, which may put some individuals lives at risk
- ✓ The internet and the e-mails are good breeding grounds for viruses, which can be sent by malicious unscrupulous individuals.
- ✓ They don't suit rural African settings especially where electricity has to be used.

TERMINOLOGIES   Connection. This is the actual process by which the browser contacts the server computer over the network**Surfing.** It means moving from place to place on the internet searching for topics on the internet.**Browsing**: means searching for particular or specific item on a Web A **Web browser** A program that fetches and displays web pages→A software program that fetches web pages from another computer and displays them to the user.→Software program that allows you access and view webpages.   →Is an application program that can be used to view or load web pages

Examples of browsers

- ✓ Internet Explorer,
- ✓ Netscape Navigator, ✓Mozilla Firefox. ✓Opera mini

Search engine.

→is a tool/program that allows a person to find specific documents by use of key word www.e.g.google,yahoo, Ask, Excite

NOTE: searching for any information on the internet is a challenging task to the user because you need to have the web address of the contents your looking for.so to simplify this, tools have been designed to help the user get whatever information your looking for without necessary knowing the web addresses. Such tools are called **Search Engines**

World Wide Web-Also called the web consists of a worldwide collection of electronic doc.each of these doc on the web is called a web page
Is a collection of electronic documents (web pages) that can be viewed or laid over the internetIt is a system of internet servers that support html documents.
It is a system of interlinked hypertext documents accessed via the internet
A web site: is a collection of related web pages
A web page:pages that contains text, graphics, audio and video and hyperlink to other document or simplify a document on internet.
NB: Each webpage on the web has a unique web address through which it can be accessed. This address is called
URL -Unique address for a Web page
A home page: is the starting page on a website.
Hyper Link. A connection in a web page that sends you to another web page or resource
a hit" Is Any Web site name that is listed as the result of a search
A hyperlink is a connection in a web page that sends you to another web page
Also called a link is a built-in connection to another related web page or part of a web page. A link can be a word, a phrase or an image.
Web master: this is a person who creates, maintains and manages a website often for a business organization.
Why webmasters are discouraged from adding many multimedia
files on the webpages
→Delay the speed of page loading
→They require a bigger storage space
Web-portal: website that provides specialized services such as email, searching news updates financial updates, weather and links to selected websites.
Is a web site which
brings information together from various source in a uniform way.(usually each information source gets its dedicated area on the page for displaying information).
Blog:

Sites generally used to post online diaries which may include discussion forums.   -
A website with content cannot be edited by the general public

WIKI-A site which users collaboratively edit its contente.g. Wikipedia→A software that allows users to freely create and edit contents of web pages using any web browser

Gopher. A technology that is used to make files available over the Internet. It is a menu-based method of searching for information on the Internet.

A protocol-A set of rules that govern the transfer of message between networks devices)

Client computer: A computer that can access the resource on a network

Terminal: This is the work station/client/computer from where data is sent or received

Cloud computing The technology that enables us to store our files and applications on a central remote server so that we can access them any time, on every computer connected to the internet in every place we go

A chat room is a location on an internet server that permits users to chat with each other by typing lines of text on the computer.

A newsgroup also called a discussion group is an on line area where users conduct written discussions about a particular subject. To participate in a discussion, a user sends a message to the newsgroups and other users in the newsgroup read and reply the message. Is required to participate in a newsgroup, and most web browsers include a newsreader.

Instant messaging-is a type of online chat which offers real-time text transmission over the internet.

Groupware is a software application that helps groups of people work together and share information over a network.

A Videoconference is a meeting between two or more people in geographically separated area who use a network or internet to transmit audio and video data

Band width. →Refers to the maximum amount of data that a transmission medium can carry at a particular time. (It and is expressed in bits per second)

→It is the rate of speed of data through a channel at a given point

→Is a term used to describe how much data you can send through a connection.

→The difference between the lowest and highest frequencies transmitted

Modem: is the combination of two words.

Modulator&**demodulator**.So a device that is

capable of converting analog signals into digital signals (**modulating**) and can also convert digital signals into analog signals (**demodulating**

Cyber Crime:-Any crime committed on a computer or committed using computers

→Any crime that involves a computer and a N/W-Online illegal acts or internet based illegal

acts

→Refers to the un authorized use of a computer set.

→Refers to the unlawful use of a computer set

Uses Of Websites

- ✓ Good for advertisements and marketing of business
- ✓ Using a website for communication is faster and cheaper than using postal offices or radios
- ✓ Can help you to get some money due people who may bring their adverts to be uploaded for public.e.g.face book is visited by many people and this can attract businesses to advertise on it and the FB owner can earn some money
- ✓ Provides room for goods display, buying and selling of our goods online
- ✓ Improves on sales or business promotion
- ✓ Can help you sensitize your clients about the use of some goods they buy from your business and also keep on updating your customers
- ✓ It can help you win your competitor in one way or the other
- ✓ Can assist you when carrying out market research
- ✓ It offer cheap means of communication
- ✓ It enables one to have feedback from the public as they are allowed to comment online

Demerits

- ✓ It is costly to design and host
- ✓ It acts as source of conflict dues to different posts from someone to respond ✓It is not effective in communication as it may take long for someone to respond.
- ✓ It is unreliable due influences of power shortage , internet coverage etc
- ✓ It can be hacked by malicious people and negative posts can be made ✓

Ways how a website can be of importance to your school

- • For advertising the school
- • Self checking i.e. comments from public
- • Collaboration purposes
- • E-learning
- • Cheap means of communication.
  Communication purpose

Ways how a website can be of a disadvantage to your school.

- ❖ Costly to design and host
- ❖ Source of conflict due to different posts ❖Not effective in communication.
- ❖ Subjected to influences of power shortage, internet coverage etc❖Can be hacked by malicious people.

The Internet Service Providers

→Is a company or individual/bodies that sells/supplies Internet in form of Bandwidth for a monthly fee

→The Company that takes care of the technical aspects of connecting your computer to the internet

Examples of ISPs companies' mtn, airtelwarid, utl

Services offered by internet service providers (ISPs).

→Internet access

→Domain name registration

→Web hosting

maintenance

→Managing traffics

accessories and

→Provide backup storage of data

→Connect their clients to the internet by

→Provide network security and parental providing the necessary connectivity   control

systems.

hardware and software.

 →Social responsibility

→Invest in general internet access

infrastructure like musts

→They do system analysis and

consultancy

→Network servicing and

→Sale network hardware

air time

Factors to consider when choosing ISP

- Initial connection cost
- The subscription fees for the services
- The available band width
- Experience in the internet field

Web/Videoconference: is a meeting between two or more people in geographically separated area who use a network or internet to transmit audio and video data. It allows participants to collaborate as if they were in the same room

It is used to conduct live meetings or presentations over the Internet/network. each participant sits at his or her own computer and is connected to other participants via the internet.

Video and audio conferencing is supported by a **VOIP** (voice over internet protocol).a protocol that enables one computer or communication device to transmit a video or an audio signal to another

device)

To carry out video conferencing, you need these items

→Microphone

→Speaker

→Web cam **And Videoconferencing software such as**

- iChat,
- Skype
- ,iVist,
- Gizmo etc),
- codec,
- modem

MERITS

→Meeting can be recorded

→In case of limited classroom, this is the best method of teaching

→Cheaper than holding physical meeting like paying for rooms, seats and

Others

→Equipments do not have to be carried around

→Schools can call meeting at short

Notice

→Do not have to pay for travelling

→Do not have to pay for conference room

Facilities

→Traveling time is saved

→Recording can be used for future reference

→It allows for voice call communications

→Communication involves users seeing their pictures on either machine

 →It saves us the risk & danger of flying/travelling

→It makes it easier for the disabled people to attend since they may find it difficult
     to travel

→Good and cheap for companies who have limited space/room

DEMERITS

→Communication may not be effective especially when some people are not close to the
microphone

→Some tools are costly

→Creates a room for lies

→Hardware Equipment can break down

→Strength of signal /bandwidth can be a problem..!!

URL (Uniform Resource Locator) Is an address that helps the browser to locate a particular web page or website. E.g. http://www.google.com helps one to access Google website. This is an address, which is typed in the address box to get a web page or website. The URL address specifies the document type, its name and the precise location on the internet. Every web page has a unique address. This address is what is known as the URL (Uniform Resource Locator).

**Examples of
URLs**.http://www.google.comhttp://www.facebook.comhttp://www.youtube.comhttp://www.thesun.co.uk

PARTS OF A URL ADDRESS

Protocol: is a standard which guides transfer of documents on internet OR is a set of rules that governs communication between computers on a network
WWW (World Wide Web). This indicates the computer which is requesting for a service.
Server name: this is the name of the computer on which the website is hosted.**Domain name:** the server name to be accessed **Parts of a URL.**

http://   www. Yahoo.   Com
1   2   3

1= mode of accessing the site (protocol)

2=Domain name (the server name to be accessed)

3= Designation for the site (the name of the company being accessed)

EXAMPLE 1

.http://www.fred/countries/uganda.org

Http   (Hyper Text transfer protocol-).
→ defines the protocol by which to access the web page A set of rules for exchanging files (text, graphic images, sound, and video) on the web.
 www.fred.org.   identifies
→ the domain name of the computer (server) where the webpage resides. In this case the server is located at
Fred **Countries**.

  → Represents the path of the URL **Uganda**.
  → Is the document name that is currently opened? **Org (organization)**
  →Top level domain in **URLN.B: http** stands for hyper text transfer Protocol, which is a standard that enables pages to transfer on the web. The address that you will use to locate or identify the location of files .it contains protocol, host name, search engine and sometimes the filename.
  Domain Name. It is the identifier of computers connected to the internet
There two types of domains1. Top level domain e.g**.com.2**. Second level Domain e.g.co.uk,.com.ac.gov.ac

  • **.edu**----------- educational institution
  • **.gov**------------ government institution
  • **.org**------------ Non-governmental organization
  • **.mil**------------ military institution
  • **.com**----------- Commercial organization

- **.co**-------------- Company
- **.sc**--------------- school
- **.ac**--------------- academic institution especially higher learning
- **.net** ------------- internet service provider

In some instances another two letter extension is added after the domain name to show the country where the website is located. For example;

- **.ug**   Uganda
- **.fr**   France
- **.au**   Australia
- **.in**   India
- **.br**   Brazil
- **.il**   Israel
- **.ca**   Canada
- **.it**   Italy
- **.cn**   China
- **.jp**   Japan
- **.eg**   Egypt
- **.ke**   Kenya
- **.de**   Germany
- **.mx**   Mexico
- **.za**   South Africa
- **.tz**   Tanzania
- **.uk**   United Kingdom
- **.com** United States

Show one way in which the internet can be a danger to. Morality-Pornographic sites on the internet can determinant to increase immorality, bad sexual behaviors among others **Labour**-agroup /class of people may be left out in the field of e-commerce and business

System Security. Hackers and crackers are a big danger to information & computer system

Human Security. With internet information has no private guarantee (hacker's Vs crackers)

Protocol

→Is a set of rules that govern the transfer of message on a network/Internet.

→Is a set of rules that governs communications between computers on a network

Computers Can Communicate With One Another Through;

➢ **The Transmission Control Protocol / Internet Protocol (TCP/IP)**
is a suite of protocols used to communicate across the Internet.
A set of rules used to send data between computers over the Internet.
→**IP** – Handles the actual delivery of data An IP is number assigned to any Internet-connected computer. E.g. 216.200.47.93
→**TCP** – keeps track of packets (divided message) for efficient routing through the Internet.

➢ **SMTP** (Simple mail transfer protocol) Used when sending electronic mails (message) over the internet/network

➢ **SFTP** (Secure file transfer protocol) This provide secure files transfer, access and management over a network

➢ **POP** (Post Office Protocol) Used by local email client to get emails from the server over transmission control protocol

➢ **TELNET (Telephone Network**) Protocol that is used by telephones for interactive text-oriented communication. It allows inputting commands and running programs.

➢ **File Transfer Protocol (FTP).**
→is an internet standard that allows users to upload and download files with other computers
-Is a set of rules which enable transfer of files from one computer to another.
- enables transfer files from a server computer to a client computer and vice versa. - Helps in uploading and downloading files.

➢ **Internet-work Packet Exchange (IPX).**A LAN communication protocol used to move data between Server and workstation programs running on different network node**s.**

➢ **Sequenced Packet Exchange (SPX).**A protocol developed to provide in-sequential data transfer for communicating from a workstation to a file server or another workstation.

➢ **Internet-work Packet Exchange (IPX).**A LAN communication protocol used to move data between Server and workstation programs running on different network nodes.

➢ **Sequenced Packet Exchange (SPX).**A protocol developed to provide in-sequential data transfer for communicating from a workstation to a file server or another workstation.

➢ **Hypertext Transfer Protocol (HTTP).**A set of rules for exchanging files (text, graphic images, sound, video) on the web.

➢ **Hypertextext transfer protocol secure** (**HTTPS**).Protocol used on internet or on network with several activities taking place for secure access FTP (File Transfer Protocol) Used when exchanging files on a network

DATA COMMUNICATION. It refers to the process of transmitting data signals from one point to another through a network. It's a process through which the signals are sent out through a channel to between communicating computing devices
→Sending and receiving information through a communication media

Elements of data communication

➢ Sender (sending device)
➢ Receiving (receiving device)
➢ Messenger
➢ Transmission medium
➢ Protocol

Transmission medium.-This is a communication channel or path over which data signal are sent.e.g.either physical (cable) or wireless (waves)
→Means through which data travels from a device to another on the network.**Communication device/signal converter.**This is a device that converts the data or instructions from the sending device into signal that can be carried by a transmission medium to the receiver.e.g.MODEM

Types of data communication tools

• **Phones**
• **Emails**
• **Social Network**
• **Instant messaging**
• **Analog signal-**continuous signal
• **Digital signal-**discrete/discontinuous

Types of transmission media (Categories of communication media)

• Bounded/Guided media/physical (wired)
• Unbounded/Unguided (Wireless)

Bounded/Guided Media

In bounded media, data signals are transmitted from source to destination through a restricted or definite pathway such as a cable.

There are several types of bounded media but the common ones are:-

• 2-wire open line cables
• Twisted pair cables

- Coaxial cables
- Fiber optic cables

They are two types of twisted pair cables:-

- UTP (Unshielded Twisted Pair)
- STP (Shielded Twisted Pair)

This consists of four pairs of twisted wires enclosed in one outer jacket.

Advantages of unshielded twisted pair

- It is of low cost
- Small in size
- Easy to install
- It's the most popular and the best for LANs **Disadvantages**

- Subject to interference
- Covers limited distance; usually 100 meters **Advantages of Coaxial cables**

- Stable even under high loads
- Used for longer distances (300 – 600 meters) ☐Transmits faster than twisted pair.
- It has a larger bandwidth of up to 1Gbps
- Can carry voice, data and video simultaneously
- More resistant to radio and electromagnetic because it's heavily insulated.

Disadvantages of coaxial cables

- Thick coaxial is hard to work with. It is heavy and bulky
- Relatively expensive to buy and install as compared to twisted pair. **Advantages of Fiber Optic Cabling**

- It is immune (resistant) from electromagnetic interference (e.m.i.) and eavesdropping.
- It is fast and supports high bandwidth
- It can cover long distances because it has low attenuation
- It can be used in hazardous places like highly flammable areas and water because they do not generate electric signals.
- It is smaller and lighter that copper cables hence ideal for space limited situations.
- They are non flammable because no electricity passes through them
- Much secure because it may not be easy to intercept light signals by unauthorized people

Disadvantages

- Connectivity devices and media are expensive
- Installation is difficult because the cable must be handled carefully

- It is relatively complex to configure or set up
- A broken section is difficult and expensive to repair.

Unguided/ Unbounded Media/ Wireless media

Wireless/unbounded/unguided media is the type of media that are used to transmit data from one point to another without using physical connections.

It refers to data signals that flow through the air. They are not guided or bound to a particular channel to follow.

Wireless communication is more convenient than installing cables but it has a slower data transfer and it is subject to interference.

Advantages of using wireless technology

➢ Wireless technology overcome inconvenience of using too many wires for communication
➢ Wireless is appropriate to use in places where cabling is practically impossible.
➢ Fast data transfer rates are possible where there are no environmental obstacles.
➢ Wireless increases flexibility and mobility at the work place because workers can sit anywhere with their computers without being limited by the extent of cable connections.
➢ Wireless technology makes it easy to set up temporary network installations.
➢ Provides high-speed communication transmission.
➢ No need to install cable.
➢ Lower installation and maintenance costs.

Dis-Advantages of using wireless technology

➢ Poor security of data on a wireless net work, outsiders can easily log on an unsecured wireless network
➢ They are prone to electrical interference from lights and radios ➢They are subject to obstructions such as walls.
➢ In general they have a limited range. Signal strength decrease as the range increases.
➢ Limited to line-of-sight transmission
➢ May be affected by temporary atmospheric disturbances

This communication is usually facilitated by a transmitting antenna and a receiver aerial. Examples of wireless media include:-

- Microwaves
- Radio waves
- Infrared waves
- Visible light
- Communication satellite

- Ultra-violet rays
- X-rays
- Gamma rays
- Bluetooth

Microwaves are high frequency radio waves that are sent through the atmosphere and space to deliver telecommunications services, including TV distributionMicrowave antennas are usually placed on top of building, towers, hills, and mountain peaks to avoid obstructions. Microwave transmissions use parabolic antenna and dishes that produce a narrow.
Highly directional signal
Merits
- They are more easily focused into narrow beams than radio waves to ease the point to point telecommunication.
- Their comparatively higher frequencies allow broadband width and high data flow. And also use of smaller antenna sizes since (the higher the frequency the smaller the antenna size).
  Limitations
- Subjected to atmospheric interference
- Can be exposed to electronic eavesdropping.

Infrared uses electromagnetic waves for transmission. It has a smaller wavelength than radio waves. It works within few feet if nothing is obstructing. An example is a TV remote control.

Satellite is a microwave station placed in the outer space. The satellite receives a signal from the earth and rebroadcasts it at a different frequency to any number of earth base stations.

Blue tooth-Short range wireless technology standard for exchanging data over short distances for fixed and mobile devices, creating **PAN.** A small chip (Bluetooth card) must be installed in the device to enable it communicate with others

WI-FI (Wireless Fidelity). Is a popular technology that allows an electronic device to exchange data wirelessly (Using radio waves) over a computer network including high-speed internet connections?
Merits. Cheaper deployment of LAN .Also spaces where cables cannot be run.
Demerits
- Have limited range.
- High power consumption
- Interference

➢ Security risks
➢ The practical range of WI-FI does not favor mobile device

Satellite (broadcasting transmission)
→Satellites are communication devices stationed in space and microwave radio as their telecommunications medium to communicate with the earth based communication facilities.
→Satellite are capable of receiving and relaying voice , data, and TV signals to and from earth based communication facilities (earth station) that use parabolic antennas (satellite dishes) to communicate with the satellites.
→Satellite microwave communication is flexible and possible with most remote sites and with mobile devices, because no cables are required, which enables transmission with ships at sea and motor vehicles
→**Satellites**: receives microwaves signals from the ground or earth, amplifies them and finally sends them back to many others earth station.→A satellite is put in space above the ground where the gravitational force is very low and it keeps on rotating in an orbit.

→This means that it is placed in outer space. And that it receives signals from the earth, amplifies it, and then rebroadcast it at a different frequency to any number of earth based stations.

ADVANTAGES OF SATELLITE COMMUNICATIONS?
    →**There is less limitation as to** the origin and destination of a transmission,
    which can originate from any point and be
received at any point within the coverage of the satellite.
→There are no obstructions, and transmission is not subject to the terrain problems faced by landlines.
→High bandwidth of several Megabytes per second can be enjoyed.
→Thousands of people can simultaneously talk through telephones using a single satellite.
→There is no sea or ocean to hinder satellite transmission and distance is not significant.
→The cost of providing satellite communications does not depend on distance.
→They can reach every corner of the world, even the most remote areas.

There are two basic transmission techniques for separating the groups of bits
Asynchronous transmission transmits one byte at a time over a line at random intervals.
Synchronous transmission transmits groups of bytes simultaneously at regular intervals

Factors to consider when choosing a communication/transmission media

- Speed of data transmission
- Cost of media
- Installation cost
- Data security

- Company/country policy
- Availability in the market

Bandwidth refers to the maximum amount of data that a transmission medium can carry at a particular time. It is the rate of speed of data through a channel at a given point

Define data transmission media.
A means through which data travels from a device to another on the network.

Give one example of transmission media.
- Twisted pair cable (wired)
- Coaxial cable
- Fiber optics
- Wireless

Computer network The collection of computers and other hardware devices linked/connected together for the purpose communication and sharing resourcesThe computers on a network must be linked by a medium such as cables, a wireless device or a telecommunication system in order to exchange dataThe network may be limited to a group of users in **LAN** or **WAN** covering several cities or regions, may also cover the entire world as the internet does.

Intranet: an internal network of an organization
Extranets: This is an intranet that extends to authorize users outside the company e.g.
NB.Astand alone computer: Is the one which is not connected to any other computer.

Functions /Advantages / Purpose of Networking Computers
- It saves funds due Resource sharing such as printers and software,
- Remote communication between devices (facebook,IM,chat room)
- Distribution of processing facility (data can be processed in different computers but stored on one computer server)
- Enable data communication
- It facilitate easy communications .e.g. emails
- Ensure security of data by putting in place administrative controls over network
- Allows for tight control over who has access to data in the system
- Enables sharing of data, information and files. stored on any other computer on the network
- It enables online learning and collaborative research
- It allows access to free common data base and databank like free software and ATM service
- Updating of software is easy since it's done together at ago on a server

- Enables centralized administration, control and monitoring of individual users on the network
- Enables workgroup computing. Workgroup software allows many users to work on a document or project concurrently
- Networks provide a very rapid method for sharing and transferring files instead of using a time consuming method of using movable disks to transfer data from one computer to the other
- Flexibility access. Users can log on and access their work from any workstation on the network.
- Improvements in entertainments (games
- The cost of buying equipment can reduce drastically since one printer can serve the whole organization, software resources can be shared instead of buying for each pc
- Backup becomes easy. Instead of asking every user to back up their data the administrator will quickly do it using the network.

Negative implications/disadvantages/ Problems of Using Networks

→It is more costly running computers on a network than stand alone computers. Examples of resources that can be shared across a network (Printers, Files and folders,

Programs/software)

→Networks are more vulnerable to virus attacks than stand alone computers

→Require skilled

knowledge and expertise because very many issues arise with network usage

→They are vulnerable to frequent crashes

→High maintenance costs in terms of software costs and hardware replacement.

→Initial cost of installing a network on cables, network cards and software are expensive. And the installation may require the services of a **technician**

→It requires administrative time and expertise for proper maintenance of a network which leads to additional cost

→Time can be wasted on social networks instead of doing meaning work

→The entire network fails if the server crashes/damaged. When this happens, the entire organization loses access to necessary programs and files

→There is increased risk of data corruption since many users will be using the system to access the same documents, some of whom may be careless or deliberately tamper with it

→Increased exposure to hackers which puts

private data at risk..!!

→There is a greater risk from viruses because; they are easily spread between the computers that are part of the **LAN**

→The break in the communication channel can stop the entire network.

→If one server breaks down may affect a number of computers due to over
Dependency on the main file server

→It is vulnerable to hackers and viruses. If a computer is a standalone, physical
access becomes necessary for any kind of data theft.however, if a computer is on a
network, a computer hacker can get illegal access

➢ Cabling and installation may be expensive
➢ Increased dishonest .every day people lie to @other
➢ It has killed face to face communication
➢ Delay in some operation due to sharing (sharing of a device like a printer)
➢ Some networks have spoilt some society values and morals
➢ Wrong information on a network
➢ Increased isolation of people (lock themselves in a room and spend days alone)

Factors an IT professional can consider before setting a computer network for an organization/School (Factors TO consider before setting up a computer network)

- Cost of installation.
- Number of computers and other devices.
- Purpose of the network.
  ⬜Nature of s/w to be used
- Network topology
- Security
- The size of the room where the network is to be established
- Distance of connectivity.
- Personnel provisions/technicalities involved.
- Ease in accessing the network/ speed on the network.
- Future growth of the organization and expansion of the network.
- The technicalities involved in the setting the network

- Number of computer and other ⬜The bandwidth to be used on hardware devices to be connected network
- Communication medium to be used such as cabling system or wireless technology

Requirements /components of setting up computer network

❖ Computers/client/workstation
❖ Network hardware devices (network card)
❖ Transmission or communication (network) media/channels ❖Network software (network protocol) ❖Server.

Computers/client/workstations.-These are other computers on the Network (except the server) that sends request to the server.They are computers on the network that receive responses from server. They are also referred to as workstation

State two factors you would consider when choosing a data communication mode.

→Cost
→Nature of data
→Data transmission speed
→Safety of the mode
→Availability to both the sender and receiver
→Effectiveness and efficiency of the mode Vs. noise.

Write any two factors to consider before choosing a local area network model

- Number of users or size of the organization
- Nature of the organization
- Level of data security required
- Networking budget
- Level of administrative support.

Factors affecting communication speed on the network.

- Transmission (Frequency and band width).
- Line configuration (point to point and multi point).
- Serial and parallel transmission (serial data transmission and parallel data transmission).
- Direction of transmission flow (simplex, half duplex and full duplex).
- Transmission mode (Asynchrones versus synchronous). -Packet switching (Getting more data on a network) -Protocols (the rules of data transmission).
- Types of processor.

→Transfer rate.

→Network

→Capacity of hardware.

→Heavy topology.

→Computer memory internet traffic.
→Bandwidth.
→The server
→Hardware problems
→Computer processor speed
→Software problems
→Distance the data travels: Malware,
→Memory available spyware and viruses:
→Technological circumstances
→Modem speed
→Cookies:
→Natural condition

<u>Network hardware devices</u>

- Hubs
- Network interface card (NICs)
- Switches
- Routers
- Repeaters
- Bridges
- Mode

Terminologies of Devices Used In Networking

Client. This is a computer that is requesting for some information e.g. A web page from another computer.

Server this is a computer that actually services the requests of other computers. It is also known as host..**Firewall.** It may mean a software or hardware that provides necessary protection of one's network against intruders

→Hardware or software for Save guarding against intruders on network

→Is a general term that refers to both hardware/software used to restrict access to data and information on a network?

Multiplexer: distributes a single channel to several/different sections or departments

Gateway: allows two networks of different configurations to communicate with one another.

Bridge. It is a device used to establish a connection/communication between different networks

Switches: is a device that allows interconnection of computers to form a network.

Hubs/ concentrator: It is a component on which computers are interconnected to form a network. **-**device that connects multiple devices to the network and its function is to send and receive signals along the network between the devices. It services as a central meeting place for cables from computers, servers and peripherals on the network.

NICs This is a device in a computer that acts as a connection point between the computer and transmission media -a network card, network adapter or **NIC** is a piece of computer hardware designed to allow
computers to physically access a networking medium.

NB. Some **NICS** are inbuilt on the motherboard while others built on a circuit board fitting into
an expansion slot inside the computer
the type of **NIC** determines the speed and performance of a network

Routers-device that links one network to other physically and logically separated networks.Is a device that determines a shortest possible route for data signal to follow.

Repeater amplifies data transmission signals to enable them move faster along a communication channel
-a device used to amplify signals along a communication channel to create long- distance networks by placing it between two segments of the network channels to overcome distance limitations **a standalone computer:** is the one which is not connected to any other computer.

Node it's a device that is connected as part f computer network. Nodes can be computers,

Dumb terminal: this is a computer system that is not capable of running its own programs but can interact with other computers via a network.

Fax. A facsimile (fax) machine is a device that transmits and receives documents over telephone lines. Documents sent or received with a fax machine are known as **faxes**. Fax capability can also be added to the computer using a fax modem.

Modem: This is an acronym for Modulator Demodulator. It converts analog signals to digital and vice versa.

State two functions of a network administrator in an organization.

→Network administrators are responsible for building, maintaining, managing, and repairing an organization's computer networks.

→Network administrators handle a company's Local Area Networks (LANs), Wide Area
→Networks (WANs) and network segments, as well as manage the company's Internet and intranet systems.

→They install and maintain hardware and software that supports an organization's networks, making sure everything is working the way it is supposed to be.

→Network administrators keep a sharp eye on network performance, taking steps to ensure user's needs are being met and repairing any problems that crop up.

→Network security is also a vital component of a network administrator's work, as they must establish a means of protecting the organization's networks from hackers and other threats.

TRANSMISSION MODES

The direction in which data flows along transmission media is characterized as

- Simplex
- Half-duplex
- Full-duplex
- Multi-plex

Simplex data is sent in one direction only.e.g. TV broadcasting.

Half-Duplex. It allows data transmission in either direction but only one way at a time.e.g. Fax machines; police radios calls, credit card verification systems and automatic teller machines

Full-Duplex .here data can flow in both directions at the same time. A regular telephone line, .

Multiplex. Several different types of signals can be carried at once through the same line. E.g. during video calls text audio and video can be multiplexed over the same line.

<center>**TYPES OF NETWORK SERVERS.**</center>

File server: One that stores various files and making them available to network user

Application server: Stores application software packages that run directly on it and made for user on the network

Printer server: A control computer that manages a networked printer from a single location   **Web server:** It allows users to access outside networks also providing web content/web

pages to users.

Mail server: Manages mails by receiving moving and storing mail on the network.

Proxy service: A computer placed between a **LAN** and an external server or networks (internet) to restrict access to data.

State three threats faced by organizations as a result of computer networking.

- Virus attacks
- Theft of hardware and software
- Acts of terrorism or malice
- Theft of ICT time.
- Poor servicing and repair
- Poor electrical installations and earth lining

TYPES OF NETWORKS

- ➢ **Local area network (LAN)**
- ➢ **Metropolitan network (MAN)**
- ➢ **Wide area network (WAN)**
- ➢ **Wireless local network (WLAN)**

- ➢ **Wireless wide area network (WWAN).**

The type of a network depends on where computers and other services are located

Local Area Network: type of a net work that covers a small area like building or two buildings.

It can be physically or wireless set up (WLAN).

Wireless local area network uses a technology known as WI-FI. Technology is known as a **wireless access point**

Advantages of WLAN over LAN

- ➢ WLAN is cheap because there is no need of buying cables
- ➢ Best for temporary network
- ➢ Very good in hard areas like rural and mountains
- ➢ Can serve a wide area since there is no cabling

> ➢ It's a flexible network whereby the user can leave one place in the working area to another and still access the network

Disadvantages

> ➢ It is not speedy
> ➢ Can be affected by environment especially when there are tall buildings
> ➢ It is complex when setting it up
> ➢ Ca be affected by hackers since people around can access using their PCs

.**Wide Area Network (WAN):**

A Network that covers a large geographical area.

WANs consist of two or more LANs connected through public networks such as Telephone lines, satellites, etc. the largest WAN is the Internet. **NB**: Computers are often connected to WAN via public networks such as the telephone system or by dedicated line or satellites.

Merits of installing a school network

> ➢ Speed in sharing and transferring of files
> ➢ Cost compared to buying individual licensed copies
> ➢ Security files on a network can be safe due to passwords
> ➢ Sharing of resources like printers fax machines, modems scanners
> ➢ Electronic mails can enable students to communicates with teachers and peers at their own schools
> ➢ Flexible access .allow students to access their files from computers

Demerits

> ➢ Expensive to install
> ➢ Requires administrative time (proper maintenance of experts)
> ➢ Must monitor security issues

Characteristics Of WANs

It is capable of covering a very wide area It is often used to interconnect several MANs and LANs It is slower than LANs and MANs because of the greater distance they cover. It is more prone to errors than LANs and MANs

Network Models Is a description of how network layers interact?

Client server:

This is a network in which there is a central computer called **server** that directs all the resources being shared to the other computers called CLIENT or NODES or workstations on the Network: **Merits**

> ➢ Its offers a reliable centralized storage and sharing of files
> ➢ It ensures high security of the network through access control installed on the server

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- it's easy to monitor the network performance on the server
- it's cheap to install software which can be done on the server a lone instead of all computers on the network
- It is secure because of centralized administration
- It is cheap to setup since all computers connect to the same machine.
- Monitoring and controls are done once for all devices
- There is no data duplication since the same file is shared by all on the network
- Privacy of one's data is ensured by creation of individual drives on the server.
    ➢Data access is faster because of known source.

Demerits

- Extra expenses on buying a server computer
- The speed of the network depends on the speed of the server machine
- In case of server failure, the entire network goes down
- There are a lot of delays since all computers are accessing the same machine
- In case of hacking of the server all organization's information is at risk

Peer to peer (P2P
This is a network where computers are connected directly to each other without relying on a server.

Merits
- It's very easy to set up
- It's appropriate in case of a small network (few computers)
- Inexpensive to set up and maintain
- Its flexible
- It is reliable since the failure of one computer does not affect the network
- ➢It is fast since tasks are shared by all devices.
- **Demerits**
- It lacks security due to absence of a server
- There is no central administration
- It is expensive in terms of networking equipment
- It is insecure because of scattered information on all computers ➢It encourages data duplication which takes up storage space.
- There is no privacy of information since all computers are open for every ones access
- It is hard to administer without centralized control.

Merits of peer –to-peer over client-to-server relationship
→Less initial expense- no need for a dedicated service
→Setup-and OS [windows XP] already in place may only need to be reconfigured for p2p operation

Network Software

A network's performance is determined by network software. Network software includes:

- Network Operating system
- Network Protocols
- Network Application software

Network Operating System

These are operating systems specifically designed to optimize the networked computer's ability to respond to service requests

Functions of Network OS

- Provides access to network resources like printers, fax, folders etc.
- Enables nodes on the network to communicate with each other more efficiently
- Responds to requests from application programs running on the network.
  Supports network services like network card drivers and protocols
  Implementing network security features like passwords.
- Error detection and control

Network Protocols

These are sets of rules and procedures that govern communication (transmission) between components on a network.

. **The Principle Functions Of Protocols In A Network Include**:

- Identifying each device in the communication path
- Securing attention of the other device
- Verifying correct receipt of the transmitted message
- Determining that a message requires retransmission if it is in incomplete or has errors Performing recovery when errors occur

The nature and characteristics of Networks and Connectivity.

- ➢ The following characteristics differentiate one network from the other:
- ➢ Topology – the physical arrangement of devices.
- ➢ Protocols -   the rules and encoding specifications for sending data
- ➢ Media – the cables that connect the devices e.g. Twisted-pair wire, coaxial or fiber optic cables

Network Topology

A network topology refers to the physical arrangement of local Area Network devices (nodes) in a communication network.

There are two methods of connecting**physical topology** and **logical topology**

Physical topology: is the Arrangement of cables, computer, and other peripheral devices in

relation to each other on a net work.

Logical topology. Is the method used to pass information between workstation on a network?

There are

- Star topology
- Bus topology
- Ring topology
- Mesh topology
- Tree/ Hierarchical topology
- Hybrid topology
- Point to Point topology

Bus Topology It consists of a single central cable that connects all computers and other devices together called a **backbone** or **Bus Advantages of Bus Network:**

- ➢ Cheap and easy to install
- ➢ Computers can be attached and detached without disturbing the rest of the network.
- ➢ Failure of one device cannot affect the network.
- ➢ It's good for smaller networks not requiring higher speeds
- ➢ Requires less cable length than a star topology
- ➢ Easy to add new workstations on the network
- ➢ Easy to connect a computer or peripheral
- ➢ It has high transmission speed if coaxial cable is used

Disadvantages of Bus Network

- ➢ If the bus itself fails, the entire network will not work.
- ➢ If more data flows, the network slows down.
- ➢ Its Limited in size and speed
- ➢ Its less secure since all data is transmitted by only one main cable
- ➢ The transmission slows down as more workstation are added

Ring NetworkA ring topology consists of a cable forming a closed ring or loop. (Ring/cycle shaped)   Topology where all devices on the network are connected to one another in the shape of a closed loop, so that each device is connected directly to two other devices, one on each side of it to form a ring. Each data packet is sent around the ring until it reaches its final destination.

Advantages of Ring Network
-It can cover a large distance.
-The speed of data transmission is high since each workstation can boast the signal
-No collision of data occurs as data travels in one direction only.
- Its orderly network where every device has access to the token and the opportunity to transmit   - Its Performs better than astar topology under heavy network load
- Cheap to install since there is only one cable between each workstation.

Disadvantages of Ring Network
-More difficult to install.
-If the cable fails, the whole network goes down

- Network adapter card are expensive

-Moves, additions and changes of devices affect the entire network.

Star Network:

All computers and devices connect to a central Hub / switch. Data transmitted passes through the hub

Advantages of Star Network

-Easy to install and maintain.

-Devices can be added and removed without disruption.

-Reliable because each device connects directly to the hub.

- Its best for large networks

- If one cable or station fails, the entire network is not affected

  - High speed transmission is possible since each station has a dedicated cable

- Greater security as connection from one station to server is unique.

- No disruptions to the network when connecting or removing devices

  Disadvantages of Star Networks

-If the hub fails, the entire network will fail.-Expensive to install.- Requires more cable length than a bus topology.-If the cable fails the workstation cannot receive data via any other route-if the hub or switch fails, attached are disabled

Tree topology

A tree topology combines characteristics of bus and star topologies;

Advantages of Tree topology

Allows for point-to-point wiring for individual segments

Supported by (compatible with).several hardware and software

Disadvantages of tree

topology

Overall length of each segment is limited by the type of cabling used.If the backbone line breaks, the entire segment goes down.More difficult to configure and wire than other topologies.

Hierarchical topology

It is like the extended star topology, except computer controls traffic instead of a hub or Switch

Mesh topology

This is a network where each device has its own connections to all other devices on the Network. It provides each device with a point- to- point connection to every other device in the network.

Advantages of mesh topology. If there are other possible routes through the network, the damage of one or several cables or computers may not have vital impact except the involved computers

Mesh networks provide redundancy, in the event of a link failure, meshed networks enables data to be routed through any other site connected to the network.

Disadvantages of mesh topology

It's the most expensive and difficult to maintain because each device has a point-to-point connection to every other device. The damage of at least one cable or device may damage the network seriously if there are only few cables in the network.

Hybrid Networks: These are a combination of Star, Ring and Bus networks.

Considerations when choosing atopology: Money. Length of cable needed. Future growth. Cable types

DEFINE THE FOLLOWING TERM.

System security. Acts and omissions taken to secure information systems against losses or damage**.**

Encryption: Writing a document in a special code for discriminated reading.

Phishing. An act of tricking people into giving secret information.

Eavesdropping: Involves listening secretly to a communication on line.

Computer crime Any criminal activities which involve the use of **ICT** to gain illegal or unauthorized access to access a computer system with intent of damaging, deleting or altering computer data

Hacking: Braking into ones computer with malicious intentions.

Asynchronous: Networking technology that parcels data into byte cells or 8-bits packets for easy transmission over communication media

Password . Is a combination of characters associated with a user name that allows a user to access a computer or a network.

State three ways to one can make a password more secure.

- Do not share your password with others.
- Do not write your password down.
- Change your password frequently.
- At least do use 8 characters if supported by the system.
- use a combination of mixed case letters and digits.
- do not use your name, birth day, ID card number or telephone number - do not use a password of all digits or the same letter.

State three threats faced by organizations as a result of computer networking.

- Virus attacks
- Poor electrical installations and earthling
- Theft of hardware and software

- Hacking
- Acts of terrorism or malice
- Cracking
- Theft of ICT time.
- Phishing
- Poor servicing and repair

Identify two ways someone's data on a computer can be misused

- Data can be deleted.
  - Data can be used to crack other systems.
  - Can be used for masquerading.
  - Data can be encrypted.
  - Unauthorized sharing.
  - It can be pirated
  - It can be duplicated.
  - It can be altere

. **In three ways how can you protect your data on the PC from being misused**

- ❖ Use of passwords and user accounts
- ❖ ❖Install anti-virus
- ❖ Data encryption
- ❖ ❖Establishment of rules
- ❖ Use of physical protection
- ❖ ❖Use of centralized administration

State three measures that can be taken to ensure safety of organizational and personal data and programs.

- Constant backups for plan B just in case disasters occur
- Securing computer installation rooms with lock and key systems, burglar proof systems, non leaking roofs and others, etc.
- Have disaster recovery plans and sensitization
- Avoiding sharing of PINs and processed devices.
  - **State two forms of disaster that can befall computer systems and installations.**
  - Fire out breaks
- Water from leaking roofs
- Lightening
- Acts of terrorism
- Robbery
- Collapsing buildings and tables

A student stored a document on his computer. Later on, he found out that the document

could not open. Give two possible causes for this.

→It could have been eaten by a virus

→He could have tried to open it in a different format

→May be the storage device could have crashed

State two precautions the student should have taken to ensure that his work was not lost.

→Should have scanned his computer periodically

→Always use the collect program when opening a file

→Follow the right procedures of shouting down system

256 School restricts the use of removable media such as flash disks, Compact Discs etc.State two reasons for doing this?

✓   To avoid the spread of viruses that could come with those storages

- ✓ Limiting of influx material that could be on those storages like pornography
- ✓ Students may carry some information that are confidential like exams

Mention two ways the school can improve security of its softcopy data.

- ✓ By use of password
- ✓ By use of firewall
- ✓ By creating different account users

COMPUTER VIRUSES, WORMS AND BUGS

Computer virus: a piece of malicious software deigned to infect/affect a computer system performance

→A program designed to disrupt the normal functionality of a computer

→It is designed to

infect and affect the computer's performance negatively.

→A computer virus is a computer program/code that copies (can copy) itself and infects a computer without the knowledge of the user

.→A computer program/code specifically designed to damage or cause irregular behavior in other programs on a computer.

Types of Viruses

Boot sector virus: this destroys the booting information and causes boot failure

File virus: these attach themselves on computer files and corrupt or delete them

Hoax viruses: These are internet based illusion/lies that are malicious

Trojan/Trojan horse: this is a program code that hides its identify in legitimate software

Worms: these are programs that stick in a computer memory and replicate to fill it up

Backdoor: these are programs that allow hidden access to a computer system

Droppers: these are programs that have been written to perform useful tasks but end up introducing virus in the process of performing their functions

Failed viruses: these are viruses that have failed to meet their goals

Packagers: these hide the existence of a virus from virus guard by masking them

Test virus: these are virus written to test anti-virus software.

Time bomb: this is a virus activated on predetermined days.e.g. idi,x-mas

Joke: this is harmless program that does funny things. Your computer is about to explode Please run away..!!

A bug: is an error in a computer system which causes undesirable result

Ways Of Spreading Viruses On Networked Computers:
Through E-mails or distributed maliciously through the internet.
Through downloads from the internet especially free ones
Through freeware and shareware.

Ways Of Spreading Viruses On Standalone Computers:

Opening an infected file. Running an infected program.Starting up the computer with an infected floppy diskette.Use of infected storage devices like floppy diskettes, hard disk etc.

Symptoms of Viruses

- Unfamiliar graphics or quizzical messages appearing on screens.
- Programs taking longer than usual to load.
- Disk accesses seeming excessive for simple tasks
- Unusual error messages occurring more frequently
- Less memory available than usual
- Access lights turning on for non referred devices.
- Programs and files disappearing mysteriously.
- Computer indicating that the storage devices are full..

Disasters Caused By Virus

- Damaging programs/software
- Deleting files/data on storage devices
- Formatting the hard disk. ▯Boot failure
- Take up / fill up the computer memory
- Causes system crashes.
- Corruption of files
- Slows down the speed of the computer

Precautions Taken Against Viruses (Control Measures)

- Ensure that there are regulations and a policy on the usage of computers and their protection (e.g. no foreign diskettes unless first scanned)
- Ensure that the e-mails are from a trusted source before opening them or e-mail attachments
- Avoid opening e-mails before scanning them for viruses
- Install anti-virus utility and update its virus definitions frequently for detecting and removing viruses.
- Never start up a PC with a floppy diskette in the drive.

- Scan all the drives and files for possible virus infection before using them.
- Write protect the recovery disk before using it.
- Back up important files regularly.

Anti-Virus Utility/ Program An anti-virus utility is a program that prevents, detects and removes viruses from a computer's memory or storage devices. This utility is installed into the computer by the computer user or owner to perform the very purpose identified above. The user is required to check or clean the computer regularly using this anti-virus.

Examples of common anti-virus programs include

A vast
-F-secure
-Raising anti vast
-Eset node 32 -Mac
fee-
-Kaspersky
-AVG
-Avira
-McAfee virus guard
-Dr.Solomon antivirus
-SMADAV   ,Comodo internet security
-Thunder byte
-panda   -norton , Pc Tools threat

Gives three functions of an antivirus in relation to controlling viruses

→It cleans files/hardware e.g. flash discs that are infected

→It deletes files that are infected

→It blocks that installation of certain files whose software certificate is not trusted

→It scans and detects computer viruses

→It isolates files that are infected with a computer virus

→It notifies the user incase of expiry of the software that the user easily perform on update or renew the program

State any three ways computer virus are transmitted in a lab

- Sharing of storage devices among various computer and users
- Downloading of files from the internet
- Sharing of files across a computer network
- Installation of software programs that are already infected
- Computer crime activities like hacking/cracking and software piracy
- Opening e-mail attachments that are already infected

SYSTEM SECURITY AND ICT ETHICS

- ✓ **Computer security risk:** is the action that causes loss of or damage to computer system
- ✓ **Hardware theft:** is the act of stealing computer equipment
- ✓ **hardware vandalism** :is the act of defacing call it destroying computer equipment
- ✓ **software theft** is the act of stealing or illegally copying software or intentionally erasing program

- ✓ **Software piracy** is the illegal duplication or copyrighted software

- ✓ **Information privacy** is the right of individuals and companies to restrict collection and use of information about them.defficult to maintain today because data is stored online.
- ✓ **A worm** copies itself repeatedly and end up using up resources and possibly shutting down computer or network,
- ✓ **Trojan horse**: hides within or looks like legitimate program until triggered.
- ✓ **Spyware** is program placed on computer without user's knowledge, "secretly collects information about user"
- ✓ **A spam** is unsolicited e-mail message sent to many recipients
- ✓ **Content filtering** is theprocess of restricting access to certain material.
- ✓ **web filtering** is the software that restricts access to specified site
- ✓ **A username** is a unique combination of characters that identifies a user.
- ✓ **A password** is a private combination of characters associated with the user name that allows access to computer resources
- ✓ **Denial of service attack (dos).** Is the example of network attack where a hacker uses unsuspecting computer, called <u>zombie</u>**,** to execute attack on other system. And the victim computer network eventually jams which leads blocking of legimate visitors from accessing the network.
- ✓ A bug is an error in a computer system (software or hardware), which causes undesirable results or unwanted procedures..a bug error can be both software and hardware problem or a programming oversight.

Effects of the computer bug (disadvantages)
- • May lead to the program crash of freeze leading to the disruption of service.
- • Some bugs (errors) qualify as security bugs and therefore may enable a malicious user to bypass access controls in order to obtain unauthorized privileges.
- • In computer controlled machines, a bug may bring system failure and result of the computer failing execute positive commands.

Prevention of bugs
Bugs are a consequence of the human factors in the programming tasks. They are caused by oversights made by computer programmers during designing, coding and data entry.The software industry has put much effort into finding methods for preventing bugs in programming which include:-

1.   **Programming style** Innovations in programming style and defensive programming have been designed to make typing errors (bugs) less likely or easier to spot.

2.   **Programming techniques** Programs can be written to check the inconsistency of their own internal data while running. If an inconsistency is encountered, the program can

immediately halt so that the bug can be located and fixed. The program can also inform the user to attempt to correct the inconsistency and continue running. These programs that locate bugs are called debuggers

3. Developing methodologies Programming has been made more automatic than manual because of simplified programming languages so that fewer bugs can be produced through human error. .

SYSTEM SECURITY AND ICT ETHICAL ISSUES

System security is the protection of computing systems and the data that they store or accessIt involves the various techniques for ensuring that data stored in a computer cannot be read or compromised by any individuals without authorized as well as protecting the physical computer that stores data from physical theft.
This is the protection accorded to an automated information system in order to ensure integrity, availability and confidentiality of information system resources.

Forms Of Computer System Security

Physical security
This refers to measures put in place to guard against physical access to the computer systems.

Physical security methods /practices
Employ guards to keep watch over the data centers and their backups Burglar proof the computer room Reinforce weak points e.g. windows, doors and roofs with metallic grills and locks Installation of alarm systems Checking lab users

Data/ Logical security
This is a form of security which deals with protection of data from being accessed regardless of whether a system has been physically access or not.

Data Security Methods/ Practices Data Encryption: This is where a document is put in a special code that can't easily be read until it has been decrypted.
Activation code: This is common with software that cannot complete installation until such code has been provided.
Password: This involves a use of a combination of characters that one must provide to have access to information or data.
Biometrics: This involves reading of the user's bio data e.g. iris, finger prints in order for the system to provide access to the stored information.
Parental controls: This involves giving different users different rights for discriminated access to data.

Computer Security Threats

This is an act or event that can breach security and cause harm, pain, dangers or injury. Some are intentional and others are accidental.

They are two types of threats;

Hardware threat

Data/information threats

HARDWARE

-The act of stealing computer equipments

-Hardware vandalism is the act of destroying computer equipments

-Fire outbreak: in the computer

-Lightening

-Bombing (where there is political conflicts in some countries)

-Floods

-Temperature rise

-Power problem

-Theft: computer peripherals like mouse, keyboards, speakers can be stolen

-Tornados': this is where a rotating column of air which also carries dust and earth objects move at a very high speed and can destroy buildings and computer devices

MEASURES

-Employ guards to keep watching over data and information

-Apply burglar proof

-Reinforce weaker access point (doors, windows)

-Do not leave hardware in an open area

-Use cables to lock the equipments

-Install lightening conductors

-Use un interruptible power supply

-Attach alarms and buzzers that will alert you when there is an external force

-The lab should be raised up to avoid floods

-Have a first aid box in the lab

-Install cameras

DATA /INFORMATION:

These are the threats that are most likely to attack our data and software .

The basic data security standards which data management technology must ensure includes

- **Confidentiality**:. it allows individuals to see only the data which they are supposed to see

- **Integrity:** here data is protected from deletion and corruption both while it resides within the database (computer) and while it is being transmitted over the network
- **Availability:** this is to secure systems that make data to be available to authorized users
- without delay.

And are some of the Data/information threats

→Computer viruses

→Phishing

→Cracking

→Hacking

→Eaves dropping

→Sabotage

→Surveillance

→Fraud -Accidental deletion

-Malicious software: programs designed to destroy our files

-Data alteration usually made by employees: some employees in an organization may change some data code and cause losses to the organization.(.e.g. a school bursar may write 10000= instead of 100,000=) -Errors and omissions (skip some part of data accidentally

-Computer crimes: this is the use of a computer or a network to commit a crime for example denial of service attacks, cyber stalking etc

-When someone accesses a computer illegally, he /she may delete your data intentionally (and is called malicious hacker hence cracker)

MEASURES

-Pass wards your files

-Limit number of passwords login

-Always save your work before you go and learn how to save

-Make a backup before you make some changes on critical data

-Perform regular maintenance

-Protect your passwords (not be share by many people)

-Never open an email attachment anyhow.

- Always run it and down load it through a virus scanner first

-Protect your network by fire walls(firewall can be a device or software that can be used to keep the network secure from illegal access. It analyses data packet and controls the incoming and outgoing packets)

-Burn all old storage devices

-Install antivirus

-Inspects and spy your data employees to reduce on errors

-Provide enough training to your staff on how to use computer and handling files

-Improve on data laws or copyrights

-Be care full when sending electronic messages to avoid internet pirates

-Ensure data integrity by checking it before keeping or sending it and see whether its not

corrupted(those are errors in a computer data that occurs during transmission or retrieval hence introducing un intended changes to original data)
-Use file and disk encryption:

NB. <u>ACCESS CONTROL</u>: Is the security measure that defines who can access a computer, when the user can accesses a computer and what actions the users can take while accessing the computer

<u>Control is normally implemented using two phase</u>(a) **Identifications** verify whether the user is a valid one.
(b) **Authentication** verifies that the user is really the one he or she claims to be.

<u>Methods of identification and authentication exist and they include</u>

- ✓ User names and passwords
- ✓ Possessed objects
- ✓ Biometric devices
- ✓ Callback system
- ✓ Personal id no.(PIN)

Passwords'; Combination of characters associated with a user name that allow a user to access a computer or network **Tips for safeguarding your password** - Do not share your password with others.
- Do not write your password down.
- Change your password frequently.
- At leastuse 8 characters if supported by the system.
- A combination of mixed case letters and digits.
  –Use A password that can be typed easily without looking at the keyboard.
-Do not Use your name, birth day, ID card number or telephone number
Possessed objects: is any item that a user must carry to gain Access to a computer or computer facility (include; badges, cards, keys)**Call back system** connects a user to a computer only after the computer calls the user back at a previously established telephone number: to initiate the call back system, the user calls the computer and then enters the correct username and passwords .the computer instructs the user to hang up and then calls the user back.
A personal Identification number (PIN) is a numeric password, either assigned by a company or selected by a user. PINs provide an additional level of security.
(c) **Biometric devices**. A biometric device authenticates a person's identity by verifying personal characteristics e.g finger prints. It translates a personal characteristic into a digital code that is compared with a digital code stored in the computer. Examples of biometric devices include.

- **A finger print scanner**, which captures curves and indentations of a finger print.

- **A hand geometry system**, which can measure the shape and size of a person's hand.

- - **A face recognition system**, which captures a live face image and compares it with a stored image.

- **A voice recognition system**, which compares a person's live speech with the stored voice pattern.

- **A signature verification system**, which recognizes the shape of a handwritten signature of a person.

- **An iris recognition system**, which reads patterns in the tiny blood vessels in back of the eye, which are as unique as a finger print.

Advantages of Biometric devices - Personal characteristics are unique and cannot be forgotten or misplaced.

Disadvantages of Biometric devices- Most of the biometric devices are expensive. - A finger print scanner might reject a legitimate user if the user cuts his or her finger. - Hand geometry readers can transmit germs. - A signature might not match the one on a file when the person is nervous.

- A voice recognition system might reject a legitimate user with a sore threat.

(d) **Call back system**. A call back system connects the user to a computer only after the computer calls the user back at a previously established telephone number. To initiate a callback system; - The user calls the computer and then enters the correct user name and password. - The computer instructs the user to hang up and then calls the user back.

COMPUTER CRIMES These are offences committed using computers. They include the following: **Trespass:** this is an illegal physical entry to restricted computer places.
→illegal access to data sent over a network
Hacking: this is an illegal access to computer held
data and information.
→The act of breaking into a computer system to gain unauthorized access.
Tapping: The use of intelligent program (spyware) to gain unauthorized access to information and data during transmission.
Cracking: this is unauthorized access to information through
breaking security systems.
Fraud: This refers to the use of computer to cheat other people.
→The
use of computer system to create fake documents, hide information or cheat unsuspecting
public with intention of monetary benefits.

Sabotage: This is the illegal destruction of data and information to cripple service or cause great loss to the organization.

Alteration: This refers to unauthorized changing of one's data and information.

Eaves dropping: this is tapping into a communication channel and listening to the communication that is not meant for you.

→This is the act of secretly listening to the private conversation of others without their consent

Masquerading: this is tricking people into revealing information by criminals pretending as the rightful sender or receiver.

Spoofing: A method of attacking a computer program and using it to gain illegal access despite the program continuing to behave normally.

Phishing: Is an act of tricking people into giving

secret information through E-mail.

→The act of attempting to acquire sensitive information like passward,user name credit card details by disguising/pretending as a trust worth source

Vishing: Is an act of tricking people into giving secret information through phone calls or voice over IP

Piracy: This is making illegal copies of copyrighted information for

commercial gain.

Cyber stalking: use of a computer to harass others

→The use of ICT mainly the internet to torture other individual through false accusation.

Pin of death: pinging means sending a message using a computer on the network to another computer to check if the computer is well connected and will be able to communicate with other computer. But the ping of death is a network attack whereby instead of sending a good message, someone sends a malicious message. A pin is usually 32 bytes and sometimes 64bytes packets, so sending more than that can destroy the computer system or the receiver!!!

Computer fraud: it involves use of a computer to conceal information or cheat other people with the intention of gaining money or information.

Denial of service attack: an attempt to make a machine or network resources unavailable to its intetended user.

Data erasure: method of software based overwriting that completely destroy all electronic data residing

on digital media

Measures of guard illegal activities of hackers

→Use of data encryption mechanisms-non-red able format

→Using fire walls at the network gateways

→Use of burglar proof doors and security lock devices

→Use of security mechanisms such as sensors and CCTV,alarms and buzzer against intrusion

→Ensuring password usage by authenticate users of data system

Backup as used in computer security

Making of copies of data so that additional copies may be used to restore the original after a data loss event

→In case of natural disasters such as fire outbreaks, earth quakes

→In the event of hackers or cracking of original data

→In case of data loss due to virus infection

→In case of hard disk crash

ICT / COMPUTER ETHICS: Are moral standards that help guide behaviors, actions and choices

Ethical issues in ict. Are the moral standards or principles that govern the use of ICT
Ethical may differ from legal in some areas!.Some practices are legal but not ethical. Take an example someone marrying a fellow man. This is legal in some countries but not ethical.
Computer ethics: these are moral guideline that governs the use of computers and information systems

Sample IT Codes Of Conduct(ethical practice)

→Computers may not be used to harm other people.

→Users may not interfere with others‟ computer work.

→Users may not meddle in others computer files.

→Computers may not be used to steal.

→Computers may not be used to bear false witness.

→Users may not copy or use software illegally.

→Users may not use others "computers resources without authorization.

→Users may not use others output.

→Users should always use computers in a way that demonstrates consideration and respect for other people.

Terms Associated With Ethics

Data accuracy: This is where data is free from errors.
Data Confidentiality: This is where data is disclosed to only authorize people.
Data Integrity: This is where data is protected against unauthorized modification.
Availability: This is where data is availed to the rightful users without delay or denial.

The major ethical issues can be summarized below as (PAPA)
P-Privacy

A-Accuracy
P-Property
A-Accessibility

1. Privacy

This is the right of people not reveal information about them. It is closely related to data security and occurs when Un authorized access tries to attack a system. It involves making illegal copies of copyrighted software, information or data   for commercial gain

i).Software piracy- The un authorized use or distribution of software

Means To Guard Against Privacy:

→Enact laws that protect owners of data and information against piracy.

→Make software cheap enough to increase affordability

→Use licenses and certificates to identify originals

→Set installation passwords that deter illegal installation of software

ii).Information privacy is the right of individuals and companies to restrict collection and use of information about them .This is the right of individuals and organizations to collect, use and disclose own information. Examples of information an individual or organization may keep private

- Credit records
- Personal habits
- Health history
- Business secrets
- Political opinions

- Business associates
- Trade union membership
- Government Data
- Financial information

.(difficult to maintain today because data is stored online)

Popularly known as cloud computing

Violations Of Privacy

Intrusion: This is an invasion by wrongful entry or possession of one's property.

Misuse of information: This is when someone gives out information wrongfully for unknown purpose.

Interception of information: This is unauthorized access to private information via eavesdropping.

Information marching: This is linking individual records in different databases.

High-tech surveillance of employees.

Employee electronic monitoring e.g. use of CCTV.
Email monitoring.
Internet activity monitoring

2.Accuracy: this involves in determining on who is responsible for the accuracy of information (authenticity/fidelity), **OR**
Who is accountable for mistakes and errors in information and how is the aggrieved or injured party can be made whole

3. Property:
This involves determining who owns information. What are the just and fair prices for its exchange or who owns the channels of information especially airways and through which information is transmitted

4. Accessibility: this involves knowing what information a person or an organization has a right or a privilege to obtain and under what conditions and with what safeguards

INTELLECTUAL PROPERTY:
This means that a company or person owns the rights to some kind of technology innovation.
Examples Of Intellectual Property
1) Music, 3) Articles 2) Books 4) File 5) Software 6) Trade secrets 7) Art pieces 8) Videos
Intellectual Property Rights These are legally recognized rights to creation of mind or ideas

→These are privileges accorded to creation of mind and knowledge.
→They involve protection against unauthorized duplication and usage.
→Intellectual property is Intangible property created by individuals or corporations that are subject to protections.

Property Rights Protection
Patent rights: This is a legal document that grants the owner an exclusive monopoly on the ideas behind an invention.
→legal instrument (intellectual property law) declaring that a computer or a person has ownership over an idea/technology
Trademarks: It is a mark that distinguishes a service or a product in the minds of the consumers from other products.
→Recognizable sign, design or expression which identifies productions or service of a particular source from those of other
Activation code: This is a password given to only the rightful owner of a service or software protecting it against unauthorized access and use.
Copyright: The legal right granted to an author, composer, playwright, publisher, or distributor to exclusive publication, production, sale or distribution of a literary, musical, dramtic, or artistic

work.(**Abbreviated as "© or (c)**

Copyright is the exclusive legal that prohibits copying of one's (the author or creator) original property without his/her permission

Copyright infringement: copying of intellectual property without written permission from the copyright holder

Need for the copyright law in the modern computer era

>protection of consumers against fake computer products

>Granting of ownership

>prohibiting of unfair profiting from other people's work/efforts

>encouragement of creativity by ensuring that creative people receive the financial benefits of their work

>ensuring good international relations and image. A country without copyright protection is viewed as one which encourage stealing

>ensuring quality products as producer try to guard their copyrights jealously

>to allow payments of damages to the copyright owner

THE FUTURE OF COMPUTERS AND THE INTERNET

Some technological advancements and trends are recognizable and can be predicted. It is easy to predict that the computers and related equipment will get faster in memory, smaller and cheaper. Computer technology will find new application and manufacturers will strive to make computing easier and cheaper. As costs decline and performance and ease of use rises, LAN"s play a bigger role in corporate information systems. Possible future trends in computer capabilities, physical size, price and software.

(a) **Future computer capabilities**.Theyare going to have more powerful, smaller processor and faster access to memory.

Will have operating systems that will handle real time data analysis and object oriented. Will have improved user interfaces that offer users easier and more intuitive access to information. Will have multi-media applications that will be fully incorporated into some information systems because data is easy to interpret when presented as a combination of sight, sound and motion.

(b) **Physical size**. Most hardware components will get smaller and faster. This means computers will become smaller and do more.

(c) **Price**. As technology advances, the price of computers will go down.

(d) **Software.** Software development will also develop to allow users easily operate computer Systems

(e) **Artificial intelligence**. Artificial

intelligence is the process of building computer systems that simulate human thought processes and actions. The goal of artificial intelligence is not to replace human intelligence which is not replaceable; rather it is to help people to become more productive. Artificial intelligence attempts to develop computer systems that can mimic or simulate human thought processes and actions. They include expert systems, natural language processing, artificial neural network and robots.

Expert systems. Expert systems are computer programs that essentially emulate the knowledge of human experts skilled in a particular field for example of a geologist or a medical doctor.

ICT EMERGING TECHNOLOGIES

Technology has and is advancing at a very high speed.

Every year we at least get some new technology in place and this happens in almost all sectors for example in agricuriture, information, industry, military and others**.**ThisTechnology is indentifying the top most promising technology trend that can help to deliver sustainable in decades to come as global population and material demands on the environment to grow rapidly.

APPLICATION AREAS OF EMERGING TECHNOLOGIES

Education e.g. in Computer Aided Learning (CAL).Telecommunication.Health e.g. telemedicine, surgery.Business e.g. online business, document processing, accounting and finance.Research e.g.

exploratory research on mars and space.Science and engineering.Military and government.Agriculture.Entertainment and leisure.Manufacturing industry.

EXAMPLES OF EMERGING TECHNOLOGIES

-Cloud computing

-4G cellular communication (mobile internet)

-Online electric vehicles

-Three-dimensional printing and remote manufacturing

-Remote sensing

-Precise drug delivery through nanoscale engineering

-Machines replacing humans (robotic)

-Humans and machines working alongside each other

3D Printing/ additive manufacturing: This is enables the printing of real objects like cups which an individual can use for drinking. It started in 2013 and is rapidly growing. **Robotics** :This deals with the design of automated machines which take the place of humans in dangerous environments.

4G cellular communication : This involves use of smart phones with many applications (apps) which have improved communication and information processing.

Artificial intelligence-AI-is the programming of a computer to have all the human senses. Such as Self hearing material, voice recognition, use of spy cameras, Devices like robots that can make

decisions on their owns because of interagency put in them

Virtual reality (programmed dream)-these are computer programs that can take you in an imaginary world and feel your presence when in reality you are still in real world

Machine vision –robots are guided to detect bombs in rooms by use of machine vision methods

Machine translation –this is a new technology that encourages use of software and hardware to translate a speech or text into someone's mother language

Artificial intelligence. Simulation or creating of intelligence similar to human .e.g.

Robotic-computer controlled device that mimics a human being in carrying out routine tasksNatural language processing

Simulation. Is a science of representing behavior of real life situations using a computerized model   **Virtual reality.**A condition in which a person becomes psychologically submerged in an artificial setting generated by a computer system

Examples of virtual reality

➢ In computer aided learning
➢ Computer games
➢ 3D movies
➢ Online advertisement

➢ Online tourism
➢ Interactive mapping (Google maps)
➢ **Areas where GPS is currently being used in business**
  →To allocate a person or an object in business

  →Create a map

  →Monitor the movement of a person or objects

  →Many cars and ships also use it to provide directions to a destination and weather information

Advantages of Using Mobile Phones

→You can carry a mobile phone with you so you don't miss important call

→If you are lost, you can call for directions

→If you are in an accident, you can call the police or ambulance – and if the phone has a camera you can take pictures of accident.

→You can listen to music, text, and play games when you're bored.

→Most mobile phones have a calculator and a phone book.

→You can use a mobile phone to call your customers or boss if you running late to a meeting

→You can surf internet & connect with the whole world by mobile.

→You can chat on face book; twitter etc. and video conference

→Keep in touch with friends and family

→Good for emergencies

→Employees can keep in touch at all times

→Customers can contact staff 24/7

→You can check your email

→It can fit in your pocket

<u>Disadvantages of using mobile phone</u>

→Mobile phones can be expensive

→They can damage your ear

→Sometimes the reception is poor in some areas, limiting your connectivity (you can't talk under group or on planes)

→People use the phone while they are driving, and this can cause problems

→They can limit your face to face time with friends and family

→Can be hard for older people to use

→Staff can abuse their phones if they have internet connection

→Because of their smaller size, they can be easy to lose.

→Some page can be heavy and large to be displayed on some phone screens

→Some web files may not be compactable on some phone screens/windows

→They are prone to virus and hard to format due to manufactures password

What are Social networking sites or service?

→Websites visited for leisure/chatting, in a real time communication (instantly)

b).Identify at least 4 examples of social networking sites.

→Face book
→Twitter
→Whatsapp→E-bay
→E-mails
→Vibers→Palm chat
→Palm play
→You-tube
→Histogram

ADDITIONAL INFORMATION

A Brower To remove dust accumulation from hardware components and system units WHILE **– a fun** Modify the condition of air in the lab such as cooling

A surge protector: only protects a computer from high voltage while **UPS** protects the computer from sudden power loss/temporary power loss unit for the computer in case of power blackout

CCTV camera. Help you inspect the place to avoid people that many need to move out with some gadgets WHILE **Web cam** – A video camera whose output displays on the web page.
Used for video calls
Trouble shooting. The process of identifying and fixing a computer problem. WHILE **ergonomic**s is to minimize injury and discomfort while using a computer

Green computing. The use of computer in line with environmental conservation WHILE **Cloud**Is the technology that allow you to keep our files on a remote server and we can access those files any time, any where

Microprocessor. This is an integrated circuit (chip) that does the entire full scale computing   WHILE **A wordprocessor** is application software that is used to create, save, edit, format and print documents that contain text and graphics.

Enter key
Pressing it will take you to a new line,
Word wrap.   Word automatically starts anew line when you reach the end of the current line and
Wrapping a text   means making a text fit in a cell when you're dealing with spreadsheet

→**Clip art**.inbult images in word processor library
→**Clipboard.** Temporary files used to store information

Page layout: Toolbar where you can set page size like orientation, column, margins
WHILElayoutit's where you can label your axes in excel and change a certain slide face in PowerPoint

Foot notes -A feature that helps you adds extra information on what you have written in your document it is put at the end of page.

   While Footer
   →Is text that is separated from the main body of text and appears at the bottom of a printed
      page margin?
   →Thesaurus-A feature that helps you find the meaning and other words that can be used
      instead of the one you want to use.
   Spelling checker Allow a user to check and correct the spelling of a whole document at one
      line.
   The system unit (system case).This is a box like computer device that contains the internal
   components of a computer. Microprocessor/CPU/Processer
   →A hardware component where all operations of the Computers take place

Multiprocessing and Multiprogramming as used in data processing
Multiprocessing: The execution of more than one program by the same processor
Multiprogramming: The processing of two or more programs by the same processor at the same time

Buffers. This is a region of memory that is used to hold data temporary while it is being moved from place to place.**Cache memory**. - Faster memory which help to speed up computer processes by storing frequently used   instructions and data

Parallel port: connects devices that can transfer more than one bit at a time, such as a printer
A serial port: transmits one bit of data at a time. Connects slow-speed devices, such as mouse, keyboard, modem

Address bus and a data bus.
An address bus consists of all the signals necessary to define any of the possible memory address locations within the central processing unit, **while** A Data Bus (memory bus) is used to transfer instructions from memory to the CPU for execution.

Reading data from the memory and writing data on the memory as used in CPU Reading:
the process of transferring data, instructions and information from a storage medium into memory. **Writing**: the process of transferring items from memory to storage medium

Machine: These are series of operation needed to execute a single instruction: **Information.** The act of changing/converting data into more meaning format /information

System update. Provides bug fixes and minor software improvement
Software update Is a purchase of a newer version of software you currently use of a more fullyfeatured version of your current software.

Single user license. A license agreement that gives a software buyer the right to use [install] software on a single computer at a time:

Site license.-Gives a software buyer the right use/install

the software on multiple computers at a single site

Firmware Also as stored logic is a combination of both the software and hardware recorded permanently on electronic chips.{usually Read- Only-Memory chip that is planted into the motherboard}. **Freeware**. Is software provided at no cost to users?

d).**Graphical user interface (GUI) operating systems**A type of user interface that allows users to interact with programs by manipulating graphics, along with a keyboard and pointing devices such as a mouse, to provide an easy-to-use interface to a program. GUI allows one to enter commands by pointing and clicking at pictures (icons) that appear on the screen. It allows the use of a mouse to click at icons or graphics on the screen.

Command-driven Operating Systems lets the user type a command at a command prompt. The commands are executed after pressing the Enter key or the Return carriage.

Formulae Is a mathematical expression used to solve mathematical problem .must begin with equal sign (=)

Functions. These are inbuilt predefined formulae that the user can quickly use

instead of having

Worksheet: - Is a grid of columns and rows. It is a component in which data values are entered. OR A single work space in a spreadsheet.

Workbook: This is a collection of worksheets

grouped together. OR Collection of work sheet

Relative referencing: A cell address that changes as the formula gets pasted to other cells**Absolute referencing:** A cell address that does not change as the formula gets pasted to other cells. A formula where a cell reference remains fixed when copied.

Labels. Any text or alphanumeric character entered in a cell

Values. Numbers which can be calculated mathematically

Row: is the horizontal arrangement labeled 1, 2, 3…

A column: is a vertical arrangement of cells labeled A, B, C…

A cell: an intersection between row and a column

Data Validation: This is the checking of input data for errors before processing.

Data Normalization: This means minimizing any data duplication as far as possible

A Flat file database is made up of one table.

A Relational database can take information from two or more database tables and combine them into a new table or report.

Primary key: A field or combination of fields that uniquely identifies each record in the table. Used to uniquely identify a record in a table.

Foreign Key: A copy of the primary key in another

table. Field that related to the primary key of another table.Used in one table to represent the value of a primary key in a related table.

Composite key: This is a primary key that is comprised of two or more fields. It can also be called a compound.

Terminal. Is a device with a monitor and a keyboard?

Dumb terminal: this has no processing power, cannot act as a standalone computer and be connected to a server to operate

Master slide Is a special slide that once designed acts as a template for the rest of the slides in the show? Its features can be applied or used in all other slides.

Web master: this is a person who creates, maintains and manages a website often for a business organization

Animation. Visual effects applied to individual items in a slide (images, titles or bulleted points)**. [**Putting monitor and or sound to various objects in your slides]   **Transition**: this is the visual movement in a given slide show. It is a method of moving one slide off the screen and bringing on another onto the screen during a slide show. Move/switch from one slide to another.

Track Ball Mouse (common on laptop computers).
A rolling ball and buttons embedded within the keyboard. Just a small head protruding through the keys on the keyboard is the one which is used to move the mouse pointer by passing a finger over it.

Touch pad mouse (Laptops). This has a
rectangular pad with 2 push buttons. The movement of a finger on the pad causes the mouse pointer to change positions accordingly.

The Optical mouse-This employs the principle of laser beam of light to transmit signals to the CPU.

Optical-This uses devices that emit and sense light to detect movement of the mouse

The cordless Mouse -This is a recent invention in the mouse technology. It does not have a cord (cable) attached to the system unit. The computer senses the mouse when it is within reach because of the program installed in it. **Cordless (either mechanical or optical)-**This transmits data using wireless technology such as radio waves or infrared light waves

→**Ant viruses.** Scan the computer to ensure proper functionality.
→**Anti-virus:** This detects and removes viruses from the computer.

Hacking: Illegal access of one's information.
Cracking: Breaking of one's security system to access his information.

Computer crime Any criminal activities which involve the use of **ICT** to gain illegal or unauthorized access to access a computer system with intent of damaging, deleting or altering computer data

Cyber Crime:-Any crime committed on a computer or committed using computers (unlawful use of a computer set)
A computer bug is an error in a computer system which causes undesirable results or unwanted procedures.
Computer error can be both software and hardware problem or a programming oversight.
Virus computer program designed to infect and affect the computer's performance negatively.
A worm is example of a virus that sticks in a computer memory and replicate to fill it

RAM. Working space of the computer that temporarily holds all open Programs
.**Registers** are high-speed temporary storage locations within the CPU used to hold data and instructions. **NB**.
(RAM is hardware while register is space/software)

Primary storage is the working space of the computer that temporarily holds all open Programs(volatile)e.g. RAM & ROM. **Secondary storage** offers permanent storage of one's information for Future reference.(backup or non-volatile)

.**Hard disk** Permanent storage device,
A DRIVE: Device that reads from and writes to disc. A
drive is a slot or an opening where a storage device or disk is inserted
Disk drive is an opening/carbine where a hard disk can be red or written to-
e).Example of optical non-volatile CD. While drive an opening for reading CD

Formatting a text means changing the text appearance.
 Formatting a Storage means preparing the storage to look new and ready for storage

Web browser. Browsing: means searching for particular or specific item on a Web
→A software program that fetches web pages from another computer and displays them to the user
.→Software program that allows you access and view WebPages.
→Is an application program that can be used to view or load web pages
Search engine.
 →is a tool/program that allows a person to find specific documents by use of
key word
www.e.g.google,yahoo, Ask, Excite

Programming language.
Are the artificial languages designed to communicate instructions to machine, particularly a computer.
→The means of communicating with the
processor.(Computer
Language processor: Programs used to translate HHL into LLL and back into HHL c).Software and system software
→**Disk cleaner**.Can find files that are unnecessary to computer operation or take up
considerable amount of space.
→**A disk checker**: can scan the contents of a hard disk to find files on areas that are corrupted in some way, or were not correctly saved and eliminate them for a more efficiently operating.

Systems administrator: The person, who designs, sets up and maintains a computer network.
Database administrator: Creates tests and maintains a database. Updates records in an information systems

An e-mail address. Unique name that consists of a user name and domain name that identifies the user. **Electronic Mail:** is the transmission of message via a computer network or internet

Internet: Is a worldwide collection of networks linked together
Network:The collection of computers and other hardware devices linked together for the purpose communication and sharing resources.
World Wide Web-Also called the web consists of a worldwide collection of electronic doc.each of these doc on the web is called a web page

A web site: is a collection of related web pages.
A web page: pages that contain text, graphics, audio and video and hyperlink to other document or simplify a document on internet.

Intranet is a network within the company and can be accessed within the company while **extranet** can be accessed even those outside company

Client. This is a computer that is requesting for some information e.g. A web page from another Pknown as host.

.**Gateway:** allows two networks of different configurations to communicate with one another.
Bridge. It is a device used to establish a connection/communication between different networks

Modulator&**demodulator**.So a device that is capable of converting analog signals into digital signals (**modulating**) and can also convert digital signals into analog signals (**demodulating**

(LAN) Local area net work physically connected and

(WLAN) wireless local area network wirelessly connected (Bluetooth,wi-fi)

WIKI-A site which users collaboratively edit its content **e.g**. Wikipedia
WI-FI (Wireless Fidelity). Is a popular technology that allows an electronic device to exchange data wirelessly (Using radio waves) over a computer network?

ICT GUIDE

1a) Explain the term information and communication technology.

Information and communication technology is the combination of telecommunication and computer technologies to enhance communication.

b) State three ways in which information technology has improved communication.

People in remote places use mobile phones to access telephone services.
ICT facilitates group discussions
People can communicate through e-mails
ICT facilitates chatting through chat rooms
Websites
Storage
Cheap
Teleconferencing
Video conferencing
Instant messaging
News groups
ICT enables people to send and receive fax messages

2) Give one reason why a school director would purchase the following equipment for a computer laboratory.

a) Blower

To facilitate cleaning of computing equipment by removing dust from the equipment.

b) Anti-glare filter screens

To regulate excess light from monitors especially CRT monitors so as to reduce eye strain.

c) Air conditioner

To regulate temperatures and monitor air distribution in the computer laboratory.

3) During a practical examination, students were required to open a blank file and save it as
D:\STUDENT WORK\EOT PRACTICAL\safety.doc

a) State the name of the immediate subfolder in which students must save the file.

EOT PRACTICAL

b) Write the root directory onto which the file must be saved.

D:\ or D:

c) Suggest one example of a computer application the student can use to create the file.

Word processing software like Microsoft word

d) State the name of the file represented by the above file path.

safety.doc or safety

4) Study the devices below and answer questions that follow.

A	B	C	D	E

a) Name the devices labeled:

A	Digital camera or camera
B	Bar code reader
C	Scanner or flatbed scanner

b) Give one major similarity between devices A and E.

Both are input devices
Both are used to feed data into a computer for processing

c) Identify one device which can be categorized as an output device.

Device D (speakers)

5) Read the statements below and write the words TRUE or FALSE in the spaces provided.

	STATEMENT	TRUE/FALSE
a)	Machine code is one of the low level computer languages	TRUE
b)	Microsoft is the only operating system in use in Uganda	FALSE
c)	WINZIP is an example of a system software which reduces the actual size of a file	TRUE
d)	A student delivering a presentation would need an LCD projector and a laptop	TRUE
e)	Screen savers can be categorized as desktop publishing software since they can be used for advertising purposes	FALSE

6a) State any two adverse effects of using internet for business and communication

Identity theft   Pharming
Hacking   Illegal taping
Cracking   Piracy
Internet based fraud   Eavesdropping
Sabotage   Plagiarism
Cyber terrorism   Loss   man
Masqueraders   hours
Phishing   Altering
                                        Virus
                                        infections

b) Suggest the most appropriate internet communication service in the following situations:
i)   Online meetings between two company employees in geographically separated regions.

Video conferencing   Teleconferencing   Instant messaging

ii) Instant and real time communication between friends.

Internet relay chats or chat rooms   Instant messaging

iii) Typed views on an on-going online discussion amongst a specific group of people.

Discussion groups or discussion forum or discussion fora

7a) Identify any three devices other than computers required to set up a network within a school environment.

Network interface cards   Hubs   Wireless access points
Router   Switches   Bridges
Repeater   Ethernet cables   Transmission media

b) Distinguish between data communication and networking.

Data communication refers to one computer transferring data, information and instructions to another computer or other computers on a communications channel whereas networking is the linking or connecting of two or more computers to share resources.

8a) List any three possible threats to data in a computer networked environment.

Unauthorized access or cracking or hacking
Computer virus infection
Information theft
Data encryption
Change of file names
Adding a password
Data deletion
Plagiarism
Pharming
Change of file location or hiding of files
b) Name any two types of security measures which can be used to control the threats listed in (a) above.

Strong passwords and usernames
Activating firewalls
Use of biometric devices

Data encryption

Prosecuting suspected culprits

Sensitize users about data safety measures

9) Given below is a notice which a head girl has typed and intends to pin up on all the notice boards in the school.

THE REGIONAL SWIMMING GALA
ON 22$_{nd}$ NOVEMBER 2014
FEEE: 5000
REGISTER WITH HEADGIRL

Explain any five word processing features which the head girl would use to enhance the appearance of the above notice.

Bolding to make the text more obvious
Font size
Alignment
Font type
Underline

Background
colour
Line
spacing
Italics
Text
highlighter
Clip art

10a) Suggest one way in which computers have been made user-friendly for persons that are physically challenged in the following areas:

i) Without hands

Voice recognition devices for data input
Use of biometric devices instead of typing passwords
Use of sensors

ii) Impaired vision

Use of sensors
Braille keyboards or data written in braille
Use of projectors
Audio enabled keyboards
Voice recognition devices for data input

Use of biometric devices instead of typing passwords

b) Give three health issues that may be caused by the prolonged use of computers.

Eye defects	Neck pain
Repetitive strain injury	Back pain
Techno stress	Fatigue
Body pain	Germs from the
Headaches	keyboard

11) Choose the appropriate file extensions from the list given for sentences (a) to (e).
.doc   .txt   .tif   .bat   .sys

a) Program files that perform fundamental operations in a computer.

.sys

b) A Microsoft word file.

.doc

c) A file containing series of commands during boot up.

.bat

d) A plain file created using note pad.

.txt

e) A graphical file created using applications such as Adobe Photoshop.

.tif

12a) State any three operations of the machines cycle of a central processing unit.

Fetching	Execution
Decoding	Storing

b) Describe any one of the operations stated in (a) above.

Fetching-obtaining a program instruction from memory

Decoding-translating instructions into commands a computer can handle

Execution-undertaking processing tasks

Storing –transferring results of processing into memory from CPU

13a) A set of instructions that are arranged in a logical way to run a computer is called:

Computer software or system software or a program

b) List any three categories of system software.

Operating system   Utilities/service programs/system utilities

Programming languages

c) Give one example of presentation software.

Microsoft PowerPoint   Kingsoft presenter   Lotus freelance
Open office presentation   Google slides

14a) Give three benefits of connecting computers to the internet

E-mails   Instant
Backup or online storage   messaging
E-commerce   E-governance
File download or upload   E-publications
Discussion groups   Online games
Weather forecast information   Software
E-learning   update
Access to news   Social
Online booking and reservations   networking
                                                     Telecommuting
                                                     Collaborative
                                                     research

b) Outline two disadvantages of connecting computers to the internet

Information theft   Additional costs
Computer viruses   Exposure   to
Hacking   pornography
Cracking   Deprives one of
                                                     privacy

15) Explain why an organization would prefer to use electronic mail (E-mail) over ordinary mail.

One can send any size of messages just at the cost of a local call.
They can be sent at any time and the results are almost simultaneous because the messages reach their destinations after a short time.
Electronic mails are highly efficient.
They save a lot of time for example you can present a report at a conference by going to it and downloading it from the conference.
Saves time, paper, and money compared to the telephone or written letters
The recipient may read the message anytime
Allows you to communicate easily with many people at once Allows
you to thoughtfully compose what you would like to say Ability to
send to multiple recipients at the same time.
It is very easy to send a reply to an e-mail as soon as it is received by using a reply button.
Large files such as spreadsheets and graphics can be sent as attachments
Can be used for advertisements
Assurance of whether the mail has been delivered is given
No use of stamps
Convenient when retrieving and delivering

16) Outline five areas of self-employment that a sub ICT student can engage in.

Offering software support	Video editing
Print publications/create/ Advert designer	Computer secretarial bureau
Photocopying and typesetting	Computer vendor or dealer
Writing CDs	Digital money transfer dealing
Music mixing	Teaching ICT
Internet café management	Computer servicing and repair

17) Use the terms below to complete the sentences that follow in (a)-(e)
   • Slide transition   • Slide design
   • Slides   • Slide show
   • Animation effect   • Slide master • Slide layout   • Handouts

a) The visual movement from one slide to another slide is slide transition.
b) The animation effects setup the way text/objects appear on a slide during a presentation.

c) The presentation of slides in a sequence on a projection screen is referred to as slide show.
d) The slide layout defines the arrangement of all items that make up a slide.
e) A user can print the entire presentation on one page by printing the handouts.

18a) State one difference between a compact disc (CD) and a digital versatile disc (DVD)

DVDs have higher storage capacity than CDs
DVDs are cheaper per unit data storage
DVDS guarantee higher quality features (sound and video)
CDs are cheaper (cost) than DVDs
Reading and writing CDs is faster than on DVDs

b) Explain the circumstances under which the following storage devices are used.

i) Memory card

When data has to be read from small electronic devices like phones, PDAs and palmtops
When there is a likelihood of making changes to files
When there is need to access files on various electronic devices
When there is need to transfer files from one device to another
When you have a memory card reader

ii) Flash disk

When there is need to access files on various electronic devices with USB ports
When files have to be kept for a long time (quickly and easily backup files)
When more files have to be added from time to time
When there is need create a boot disk

19a) Describe the following terms in programming languages
i) Interpreters

Interpreters are programs that read one of the source language instructions line by line and change it into machine language when the program is running.

ii) Syntax

The grammar of a programming language

iii) Debugging

Detection and removal of syntax and logical errors in a program.

b) Identify two characteristics of a good programming language.

    Suitability to the problem
    Availability
    Clarity and simplicity
    Consistency
    Efficiency
    User friendliness

20) Using the e-mail address: annet@gmail.com, identify what these parts stand for:

a) annet

User name
User
User ID
Unique ID

b) @

Symbol that separates the e-mail user name from the rest of the address

c) gmail

Domain name
The service provider
Server name

d) .com

Organization name (where the e-mail account is held)
Top level domain (type of domain where the e-mail account is held)

1. The table below shows specifications of two computers X and Y.

Computer specifications	Computer X	Computer Y
Processor	Intel ® 3.2 Ghz	Intel ® 3308Mhz
RAM	1GB	2000MB
Hard disk	4600MB	50GB
Monitor size	19"	15"

a) Which of the two computers would you recommend for a company to buy?
   Computer X

b) State two reasons to defend your answer;
   Higher processor speed 3.2 GHz
   More random access memory 1GB

c) Which is the least important of the computer specifications given in the table? Monitor size

d) State one reason defending your answer above.
   Does not affect the output of work
   Does not affect performance of the computer

   2a) Explain how computers can professionally be used by: i)
   Teachers
   Collaboration tool and exchange of ideas
   Tool for teaching and learning
   Assess and grade learners
   Store learners' notes and marks

   ii) Doctors
        Monitoring patients
        Medical consultation
        Telemedicine
        Therapy
        Simulations
        Medical research
        Carrying out operations on body parts
        Scanning for diseases Prescriptions of
        drugs

b) State one health risk associated with continued usage of computers.

Germs from the keyboard

Eye defects

Repetitive strain injury

Techno stress

Body pains

Headaches

Fatigue

Wrist pains

3a) Explain the following terms in a spreadsheet i)

Values

Data that can be manipulated or calculated

ii) Labels

Text based entry that identifies data   Non mathematical data

Words on column headings

b) Name a symbol used when writing functions in a spreadsheet.

Equal sign (=) or @ sign or plus sign (+)

4a) Give three devices that can be used to transfer files from one computer to another

Flask disk	Zip disks
External hard disk	Floppy
Compact disk	diskettes
Digital versatile disk	Memory
Blue ray disk	cards
	Magnetic
	tapes

b) Explain the following methods of transferring a file from one location to another.

i) Drag

Method of moving a file or folder from one location on the screen to another by use of a mouse

ii) Copy

Method of creating a duplicate of a file or folder

5a) Give three factors a company should consider before buying any storage devices.

Storage capacity

Cost

Safety of media/nature of work to be stored

Compatibility of the media with system-IDE, SATA or USB

Brand/make/durability

Data access speed

b) How many kilobytes are in six megabytes per second?

1MB=1024KB   6MB=1024X6   6144kilobytes

6a) Give one use for each of the following computer devices i)

Power supply unit

Some have a fuse to protect the system

Convert AC from mains to DC used by the system

Receive and distribute power to different system parts in required voltages

Alternate power to regional voltage settings (110 or 240V)

Provide protection to user against electrical signals

ii) System case

Provide earthing for the system

Facilitate movement of the system as a unit

House the computer processing hardware

Protect internal components against dust, dirt and falling objects

Provide attachments for holding different units together

iii) CMOS battery

Powers up the CMOS chip which stores configuration information about the computer.

b) Explain the following

i) Analog device

Can measure, record, and reproduce continuous data/information

Receive data and information inform of changing phenomena

ii) Digital device

Receive and understand data and information in binary digits-0s and 1s

Generate, store, process data using discrete values-numbers and digits'

7a) State three types of computer software

Computer aided design (cad) software	Spread sheet software
Multimedia software	Word processing software
Project management software	Paint/image editing software
Personal information managers (PIM)	Video and audio editing software
Presentation software	Web page authoring software
Graphics processing software	Communication software
Desktop publishing software	Education software
Database software	Personal finance software
	Reference software
	Entertainment software

b) Differentiate between a software version and a release.

A software version is a major upgrade in a software product leading to even change in the software interface and some procedures whereas a software release is the public or private distribution of a new or upgraded version of a software product.

8a) State two internet based tools that support web based research.

Search engines like Google	Online libraries/books like Google books
Web browsers	Online encyclopedia like Wikipedia, Encarta
Hyperlinks	Gopher

b) Identify three things one would require in order to get connected to the internet.

Any communication hardware like modems, routers, switch, hub
Communication software for browsing
Internet service provider for connection
Physical/wireless connection media
Network operating system
Phone/computer

9) Outline five factors which determine data transmission speeds over the internet.

Nature of material one is trying to access or send-graphics tend to load slowly
Bandwidth
Modem/routing device speed and positioning

Network data traffic at a time

Data transmission media

Environmental factors/natural conditions-rainy, cloud, stormy weather and thunder usually affect transmissions negatively

Malfunction of computers-hardware problems-poor network card, video card or signal receiver Computer processor speed

Malware, spyware and viruses-software problems-cookies

Memory available

Computer internet setting

10) Give five factors an organization should consider before choosing a local area network (LAN) model.

Size of organization: a point to point is ideal for about ten users at a time

Networking budget: where server based networks demand much more money

Needs of the network itself: administrator servers

Level of data security needed: server based network models are more secure

Amount of traffic expected

Nature of business

Level of administrative support

Future needs of the organization-scalability

11a) Write the initial procedure of 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

OR

Switch on the mains

Switch on the UPS or stabilizer

Switch on the system unit and finally switch on the monitor

Power on self test is conducted by the BIOS

Bootstrap loads the OS into RAM

The desktop is activated

b) Give any two measures taken to ensure that computers in a laboratory are safe.

The computers should be properly switched on or off

Avoid illegal connections and disconnections

Avoid exposing computers to heat/direct sunlight

Keep away with bags

Foods and drinks should not be allowed in the computer laboratory

Keep the computers in a dust free environment

The repairs should be done by technical persons

The computers should be connected to the UPS or stabilizer

Keep fire extinguishers to guard against fires

Computers should be allowed to cool down before covering them

Lock the laboratory after use of computers

Use burglar proofing

Install and update antivirus

Have usernames and passwords to access the computers

Setup lightening arrestors to guard against thunder

Use firm tables to hold the weight of hardware

12a) A computer file is made up of a file name and a file extension. i)
What is the purpose of a file extension?

To identify the file type

Helps to organize files

Files can easily be located

Determine which program to open the file

ii) Write down the file extension for a word processed document.

.doc

.docx

b) In which two ways can an accidentally deleted file be recovered?

Restoring from the recycle bin

Use of the undo command

Use of recovery software

Drag from the recycle bin

13) Why would there be a need to replace CRTs with LCDs?

Portable

Releases less radiations

Consumes less power

Occupies less space

Can easily be mounted onto the wall

Has inbuilt antiglare screens

14. Indicate True or False against each statement in the table below.

		True/false
a)	Windows Xp is a graphical user interface operating system	TRUE
b)	Presentation software supports multimedia	TRUE
c)	Word processors have formula bars	FALSE
d)	Backup is to combine the content of two or more files to produce one output file	FALSE
e)	The disk operating system is menu driven	FALSE

15) Write down any five advantages of using off-shelf applications.

Cheaper to buy

Easily available from many vendors

Thoroughly tested to eliminate bugs

Lots of user support-books, user guides, online help, discussion forums

Easy to learn and use (user friendly)

Can be customized

Easy to restore

Easy to share files

Used to perform several functions

16a) Explain the term software piracy.

Unauthorized duplication and use of computer software

b) Write down any three precautions taken to prevent software piracy.

Use of a code key/ serial

Sensitizing users on illegal use of software

Use of holograms-a component which comes with original copies and cannot be duplicated

Require software authentication and activation

Incorporate flexible licensing

Prosecute software pirates

17) The table below shows part of a database. Use it to answer the questions that follow.

EMP NO	NA ME	TEL NO	SAL ARY	NO OF MON THS	TO TA L PA Y

E22 7008	Bet ty	077426 7820	$700, 000	3	
E22 7011	Kin tu	070199 8142	$400, 000	4	

a) Write down the data types entered in the following fields.
i) TEL NO   Text
ii) SALARY   Currency

b) Suggest a suitable primary key.
Employee No.

c) The formula entered in the design view to determine TOTAL PAY, which is a product of SALARY and NO OF MONTHS is?
=[salary]*[No. of month] in the form
[salary]*[No. of month] in the query

18) State any five characteristics of a modern computer.
Speed
Accuracy
Versatile
Diligence
Storage
Automation
Artificial intelligence
Communicative

19) From the given terminologies used for internet and networks below, choose the correct one to complete each of the statements that follow.

A discussion group   Instant messaging Video conferencing
A chat room   Online shopping   Telephony

a) The type of internet communication that allows multiple users to exchange messages in real time is called:
   Chat room
b) The type of internet communication that enables individuals to post messages on a particular topic for others to read and respond to is:
   Discussion group
c) The use of multimedia technologies in communication is called:

Videoconferencing

20a) Explain the following terms as used in electronic mail
i) Blind carbon copy (BCC)
Used to hide an e-mail address so that none of the recipients can see whom you have
 sent the message

ii) Carbon copy (CC)
Used when sending a copy to more than one address without hiding

b) State one requirement needed for one to send an e-mail.
Internet connection/network
Electronic mail account/address on any email provider sites and most of them are free
for platinum users for example Gmail

1a) Distinguish between Random access memory (RAM) and secondary storage

RAM is the working area for the computer user that provides temporary storage for data,
programs when the computer is running whereas secondary storage is a kind of storage
that provides a relatively permanent for of storage for data and information when the
computer is running or even when the computer is turned off.

b) Give an example of secondary storage.

Floppy diskette   Compact disks
Magnetic tape   (CD)
Zip disk   Digital   video
Jaz disks   disks (DVD)
Hard disk   Memory cards
Microfiche and microfilm   Smart cards
                                             Flash disks

2) Explain each one of the following database features.

a) Field name
Database feature assigned to each field to identify the different fields.

b) Field properties
Determine how data is handled, stored and manipulated
Further define data types and formats like field size, default values

c) Data type
Specify the kind of data a field can contain and how the field is used.

3a) Distinguish between computer servicing and computer repair

Computer servicing is the caring for a computer to preserve it in a good working condition and to prevent damage while computer repair is the restoring of a computer to an acceptable condition by removing and then replacing or mending of damaged parts.

b) Write one reason for having the following items in the computer laboratory.

i) Woolen carpet
Absorbs moisture from the floor
Absorbs sounds from movements
Protects devices from damage when they fall
Protects users from electrocution
Absorbs dust and prevents it from entering the computers

ii) Blower
Removing dust from computer parts

iii) CCTV cameras
Record and playback activities for reference purposes
Surveillance-act as a deterrent to theft and other crimes
Monitor security at data centers

4a) Don is a new computer user. As an ICT student advise Don on which tool to use:

i) To trace files he cannot locate
Search from startup menu
Run on startup
Use search utilities like AVA find and search everything

ii) To trace a word from an open document
Find
Search

b) A student is typing a document using Microsoft Word. Write down three steps the student will use to shut down the computer.

Save the document and close the document

Click on the start button

Choose turnoff or shut down

5) State five activities that can be performed on a computer when using a mouse piece.

Pointing at items   Zooming windows

Dragging and dropping items   Moving the pointer

Clicking   Selecting or highlighting items/text

Double clicking   Drawing images

Scrolling   Creating shortcuts

6) Identify five ICT related employment opportunities in Uganda today.

Writing CDs   Computer servicing and repairing

Music mixing

Internet café management   Advert designing

Video editing   Computer laboratory attending

Computer secretarial bureau management

Computer vendoring or dealing   Switchboard operating

Digital money transfer dealing   Computer programming

Teaching ICT   Software engineering

Network administering

Servicing and repairing computers

7a) What is multiprocessing?

Involves the coordinated processing of tasks/programs by more than one processor

b) Give two advantages of each of the following operating systems.

i) Windows

Readily available on market

Software downloads, patches, fixes are available online

Supports networking

Supports multitasking

Compatible with almost all machines

Interoperable with most software

Easy to use since it supports many interfaces

Easy to learn

Light-takes little disk space

User support readily available online

163

ii) Linux

    Supports networking

    Supports multitasking

    Interoperable with most software

    Compatible with almost all machines

    Free of charge

    Flexible-users can change the code-open source

    Resistant to viruses

8a) Name two examples of application software

Microsoft word	SuperCalc	Corel Ventura
Word pad	Microsoft access	QuarkXPress
Notepad	D-base Fox	Broderbund
AmiPro	pro Paradox	Print Shop
Microsoft Excel	Adobe in	Pro
Corel Quattro pro	design	Corel drawing
Lotus 123	Adobe page maker	Microsoft
VisiCalc	Microsoft publisher	photo draw
		Adobe photo
		shop

Microsoft power point	Corel draw
Corel presentations	Macromedia free hand
Lotus freelance graphics	Microsoft PhotoDraw
Harvard graphics	Adobe Photoshop
Microsoft outlook	Meta creations painter
Corel CENTRAL	Adobe premiere
Lotus organizer	Ulead media studio pro
Palm desktop	Ulead video studio
Corel catalyst	Fireworks
Microsoft project Primavera sure	Adobe Go live
track project manager Autodesk	Adobe page Mill
Auto CAD	Macromedia dream
Microsoft Visio technical	weaver Macromedia flash
Macromedia author ware	
Macromedia director	
Macromedia flash	
Adobe illustrator Paint photo	
shop	

9a) What is the World Wide Web?
A global collection of electronic documents accessible through the internet

b) Show three ways in which the internet can facilitate trade and business.
Facilitates advertising
Facilitates business and trade communication
Facilitates online booking
Traders may pay online
Traders can exchange transaction documents online
Buyers can inspect documents online

10) Show one way in which the internet can be a danger to:

a) Morality
Exposure to pornography and illicit materials
Loss of respect to the elderly
May lead to juvenile delinquency
Young people may learn to take drugs
Decline in cultural norms and values

b) Labour
Loss of man-hours when workers surf at the expense of their work
Workers may do personal research wasting organizational resources
Internet may replace some workers rendering them jobless
Redundancy of workers when the internet connection fails
A lot of trickery and wrong information about jobs over the internet
Facilitates surveillance leading to loss of workers' privacy
Loss of craftsmanship and creativity due to over reliance on computers

c) System security
Facilitates rapid spread of computer viruses
Illegal access from hackers and crackers
Facilitates phishing and pharming

d) Human security
Facilitates surveillance which leads to loss of privacy
Defamation
Identity theft
Cyber bullying
Cyber terrorism

Impersonation
Abusive and threatening messages

e) Information

Eavesdropping	Wrong information
Computer viruses	Change of data and information along
Plagiarism	communication lines
Unreferenced information	

11) Explain the following attributes of computers which make them dependable and reliable tools.

a) Diligence
Computers can perform the same task over and over along period of time without getting tired.

b) Versatility
Computers can be used for many different tasks and can change from one task to another.
Computers can be used to perform completely different tasks at the same time or one at a time.

c) Accuracy
Computers are thorough/systematic/orderly once right instructions and data are entered. Computers are so accurate that they hardly make mistakes.

12a) Describe the term computer literacy
Computer literacy refers to having the knowledge and understanding of computers and their uses.

b) Outline any three ways in which ICT can improve the quality of education.
Through e-learning that links schools and institutions
Through enabling multimedia usage which makes learning interesting
Saves educational costs
Facilitates educational research
Tool for teaching and learning
Enabling sharing and update of notes
Facilitates efficient information processing and communication

13a) Distinguish between copy a file and move a file.

Copy a file involves making a duplicate of a file while move a file involves changing the location of a file/transferring a file from one location to another.

b) Study the file path below and answer the questions that follow.

F:\accounts\bursar\fees.xls

i) Identify the file name   Fees or fees.xls

ii) On what drive is the file located?   Drive F

iii) In which sub-folder is the file   Bursar
located?

14a) List any three input devices

	Digital camera
Keyboard	Bar code reader
Mouse	Digital video camera
Touchpad	Web camera
Trackball	PC camera
Stylus and graphics tablet	Electronic whiteboard
Joystick	Magnetic stripe reader
Microphone	Optical mark recognition (OMR)
Light pen	readeMagnetic ink character
Pointing stick	recognition (MICR) reader
Scanner	Optical character recognition
MIDI device	(OCR) reader Touch screen
Sensor and remote sensor	

b) Give a function of any two input devices listed above.

A PC camera allows home users to record, edit and capture video and still images and to make phone calls on the Internet.

Digital cameras record images digitally on a disk rather than on a film and the images are transferred or downloaded onto the computer.

Digital video cameras record motion digitally on a disk and have the capability to take still images as well.

A pointing stick is located in the middle of the keyboard and to control the pointer, you direct the stick with your finger.

A touch pad is used to control the pointer by moving and tapping your finger on the surface of a pad.

A trackball is used to control the pointer by rotating a ball with your thumb.

A light pen is a light sensitive pen-like device that is placed against the monitor for entering or changing data for example editing digital images.

A touch screen is a screen on which one is able to select actions or commands by touching the screen with a finger.

A mouse controls the pointer that is displayed on the computer screen.

A joystick is the most popular input device for computer games.

Webcams are cameras that capture images and send them to a computer over the Internet.

A scanner is a device that can read text or illustrations printed on paper and translate the information into a form the computer can use.

BCR are scanners that interpret vertical zebra stripped marks seen on most manufactured retail products into digital form before passing them into the computer for processing.

MICRs are used by banks to automatically read those unusual numbers on the bottom of cheques and deposit slips.

OCR devices read special pre printed characters and convert them in a form which can be understood by the computer.

Magnetic strips readers are used to read information contained in the magnetic strips on cards.

The keyboard is the most common device used for entering data and commands into a computer. OMRs are devices that read pencil marks and convert them into computer usable form before entering them into the computer.

The graphics tablet and stylus are mainly used for computer aided design and drafting by architects, mapmakers, artists and designers.

Voice recognition systems provide the computer with the capability to distinguish spoken words.

A light pen can make selections, place images, draw and indicate dimensions by simply touching the screen.

A microphone is an input device that allows a user to speak to a computer to enter data and instructions into the computer.

MIDI devices can be used to create, record and play back musical compositions

A Sensor and remote sensor is an input device that can detect external changes in an environment

15) Identify the following from the email address: robert@yahoo.com

a) i) Domain name   yahoo ii)   User name robert

iii)   Top level domain name   .com

b) i) Which type of organization does the domain name of the email user above subscribe to? Commercial organization

ii) Give any other example other than the one you have stated above.
Military organization (.mil)
Educational organization (.edu)
Networking organization (.net)
Non governmental organisation (.org)
Government organisation (.gov)

16a) Define the term computer network.
A group or collection of computers connected or linked to each other to share resources and to communicate.

b) Give three disadvantages of networking computers.

Hardware, software and expertise needed are costly
Vulnerable to security problems since it facilitates easy spread of computer viruses When the server fails the whole network may also fail

17a) Differentiate between a server and a client computer

A server is a computer that controls resources and responds to requests for resources from other computers whereas a client is a computer that requests for resources from the server.

b) What is the function of each of the following network devices? i) Bridge

Used to connect similar networks

ii) Switch

Used to connect network segments and storing the address of every device connected to it

iii) Router

Used to send communication traffic to appropriate network using the fastest available path

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

	A	B	C	D	E	F
1	ID NUMBER	Name	Item 1	Item 2		
2	100000	Akello	990	34	29.1	
3	100002	Nambi	660	56	11.8	
4	##########	Busingye	880	-	#DIV/0!	
5			#NAME?			
6						

a) i) Suggest a reason why the entry in cell A4 appeared as shown. The column width is not wide enough

ii) How do you rectify the error in cell A4?
Widen or increase the column width
Autofit
Reduce the font size

b) What does the error in cell E4 mean?
Attempting to divide a number by zero (0) which is mathematically wrong

c) How do you correct the error in cell C5?
Typing the correct function name

19a) Tick the three utility programs from the list below.

	TICK HERE
Web browser	
Data compressor	✓
Disk defragmentor	✓
Operating system	
Antivirus software	✓

b) State the function of any two utility programs you ticked above.

Disk defragmenter
The disk defragmenter utility reorganizes files and unused space on a computer's hard disk to access data more quickly and programs to run faster.

Antivirus utility
An antivirus utility is a program that prevents, detects and removes viruses from a computer's memory or storage devices.

Data compressors output a smaller file when provided with a stream or file.
20a) Explain the following terms giving an example in each case

i) Simplex
Data transmission in only one direction

Examples
Television broadcast
Radio broadcast
Keyboard transmission
Pagers
Temperature sensors

Door bell

ii) Half duplex

Data transmission in both directions but not at the same time

Examples

Radio call

Fax machines

Credit card verification systems

Automated teller machines

Walkie tokie

b) Identify one non-physical data transmission media.

	TICK HERE
Optic fibre	
Bluetooth	✓
Twisted pair	

UGANDA NATIONAL EXAMINATIONS BOARD
DRAFT MARKING GUIDE 2017
S850/1 SUB-ICT P.1

1. (a) **Tools used to remove dust from a computer.**
      - Blower
      - Sucker
      - Wiper / Dry cloth

Any 1 x 1=1mark

(b) **Reasons why one would require the following in computer laboratory.**   (i)   **Un-interruptible power supply.**
      - To give time to the user to save his work by supplying power for a few minutes after power has gone off / is insufficient / unstable -   To safely turn off/shut down the computer.
      - To temporarily supply power to enable the user complete work at hand.

Any 1x2=2 marks (ii) **LCD projector.**

- To provide a display/show on wider view to the learners.
- To eliminate the use of chalk which can create dust in the laboratory.
- To minimize the electro-magnetic radiations.

Any 1x2=2 marks

2. (a) **The procedure for changing the name of an existing file or folder.**

- Select/right click the file/folder.
- Select rename/properties from the drop list.
- Type the new name and press enter/click on the icon to confirm.

OR

- Select the folder/file.
- Press F2 on the keyboard.
- Type the new name and press enter to confirm.

OR

- Open the existing file.
- Select 'save as' from the file menu/office button.
- Give the file a new name and press enter to confirm.

OR

- Point at the file/ folder name
- Two single clicks
- Give the file a new name and press enter to confirm.

Any 3x1=3 marks (b) **Function of the device driver in a computer system**

- They enable computer components communicate.
- They act as an interface between peripheral devices and the computer.

Any 1x2=2 marks

3. **Write the following in full.**
   a) **CCTV**:   Closed Circuit Television
   b) **ROM**: Read Only Memory
   c) **CAD**: Computer Aided Design
   d) **CPU**: Central Processing Unit
   e) **VDU**: Visual Display Unit / Video Display Device

Any 5x1=5 marks

4. (a) **Storage devices resistant to virus attacks.**
   - CD-R
   - CD-ROM

- DVD-R
- Blue ray
- DVD-ROM

Any 1x1=1 mark

    (b) **Describing the following terms as used in computers.**
        (i)   **File**: A block/collection of related data/information with a

name.

2 marks

        (ii) **Folder**: It is a virtual container for files and sub-folders.   **2 marks**

5. (a) **Categories of the components of a computer system.**
- Hardware. -   Data - Software.
- User
- Procedure   **Any 4x1=4**
    marks

    (b) Function of any one category you have stated in 5 (a).
➢ **Hardware can be used for:**
- Input of data.
- Output of data.
- Storage of data.
- Processing of data.
- Communication.
➢ **Data:**
It acts as a raw material for information.
➢ **Software:**
- Controls/manages the operations of the resources.
- Provides the user interface.
- Guides computer operations.
- Provides security on data.
- Computer error management.
➢ **User:**
- To instruct the computer system.
- To program the computer system.   **Any**
    1x1=1 marks

6. Indicating TRUE or FALSE
    (a) FALSE
    (b) TRUE

(c) FALSE

(d) FALSE

(e) TRUE

Each 1 mark=5 marks

7. (a) **Definition of hardware.**

Refers to the physical/tangible component of the computer.

2 marks **(b) Ports used to connect devices on a computer.**

- Ethernet port. - SD port
- Ps/2 port - MIDI port
- USB port - Fire wire/1394 port
- Parallel port - Audio ports
- Serial port - SCSI Port
- HDMI port
- VGA port

Any 2x1=2 marks **(c) Devices used to transfer a hardcopy document to a computer.**

- Scanner
- Digital camera
- Fax machine (facsimile)
- Smart phone

Any 1x1=1 mark

8. (a) **Definition of system software.**

System software is a set of programs designed to manage operations of the computer and avail computer resources to the user

1 mark **(b) Functions of an operating system.**

- Allocating system resources.
- Provides user interface.
- Offers data and software security.
- Scheduling computer jobs/tasks.
- Managing computer memory.
- Monitoring system performance.
- Provides platforms for applications to run.
- Establishing network connections.
- Managing booting processes.
- Device management.

Any 4x1=4 marks

9. **(a)** **Distinguishing reading and writing**

   Reading is a process of transferring data/instructions and information from a storage medium into memory

   While

   Writing is a process of transferring data/information from memory to a storage medium.

   For both sides correct. **2 marks**

   (b) Example for each of the types of storage devices given below.
   - (i) **Optical storage:** CD-R, CD-ROM, CD-RW, DVD-R, DVD-ROM, DVDRW, Blue Ray
   - (ii) **Magnetic Storage:** Hard disk, Floppy disk, Magnetic tape, Zip disk, Jazz disk.
   - (iii) **Solid State:** Memory card, Flash disk

   Any 3x1=3 marks

10. **(a)** **Examples of documents created using desktop publishing application.**

   - Calendar - Adverts - Magazines
   - Cards - Newsletter - Posters
   - Invoice - Fliers - Web pages
   - Brochures - Certificates - Signs
   - Label - Book covers - Menu **Any 2x1=2 marks**

   (b) Desktop publishing features that can enhance the documents.
   - Templates. - Borders
   - Color separation - Font color
   - Frames - Font faces
   - Graphical objects - Font styles
   - Text boxes - Alignment

   Any 3x1=3 marks 11. **(a)** **Threats that system administrators may face as a result of networking computers.**

- Eavesdropping / lack of privacy
- Data fabrication/modification
- Data theft
- Pharming
- Phishing
- Hacking
- Virus attack
- Cracking

- Spamming
- Plagiarism
- Taping
- Sniffing
- Spoofing
- Vishing

Any 3x1=3 marks

(b) Measures employed to reduce the network threats.
- Use passwords.
- User account authentication
- User access control levels
- Use anti spyware
- Use antivirus
- Data encryption
- Use firewalls
- Use biometric authentication.
- Use possessed objects e.g electronic cards

Any 2x1=2 marks

12. **(a)   Naming elements of data communication.**
    A. Sender/sending device
    B. Communication channel/path or transmission medium
    C. Receiver/receiving device

Any 3x1=3 marks (b)   Device used to connect A to B
- NIC (Network Interface Card)
- USB card

1 mark

(c)   Protocol used to uniquely identify A and C
Internet protocol

1 mark

13. **Indicate INPUT or OUTPUT**
    (A) INPUT
    (B) OUTPUT
    (C) OUTPUT
    (D) INPUT
    (E) OUTPUT

Each 1 mark=5 marks

14. **(a)   Reasons for using electronic application in budget preparation.**
- The inbuilt mathematical formula and functions provide quick manipulation of data.
- It has automatic recalculation features.
- It has grid lines therefore no need to draw tables.
- The **what if** analysis enables predictions and projections to be made faster.
- It provides a variety of graphical representations of data for better analysis.

Any 2x1=2 marks

(b)   Use of the following applications; (i)   Presentation software:
- For creating slides to enhance speech.

- Used for making animated graphics for adverts.
- Creating handouts.

Any 1x1=1 mark

(ii) Word processor:
- Used to create letters.
- Used to create memos.
- Used to create a document and send it to multiple people.
- Used to create CVs.
- Used to create reports.

A

ny 1x1=1 mark (ii) Communication software:
- It is used to exchange information electronically.
- It is used to create an electronic message.
- It facilitates management of stored E-mails.

Any 1x1=1 mark

15. **(a) Example of a presentation software.** - MS PowerPoint
- Lotus Freelance graphics.
- OpenOffice Impress
- Corel presentation
- K-presenter
- Screencast
- Google slides

Any 1x1=1 mark (b) Importance of the following features;
(i) Master slide:
- It is used to determine the appearance of all slides in a presentation in terms of format.

2 marks

(ii) Transitions:
- Determine how slides appear/enter and disappear/exit on screen in a presentation.
  OR
- Adds animation effects on slides as they appear/enter and disappear/exit on screen during presentation.

Any 1x2=2 marks

16. **(a) Advantages of using E-mail services over sending mail by post.** - Faster delivery of information by E-mail.
- E-mails services are cheaper in term of delivering Information.
- E-mails are more secure since can be protected by passwords.
- E-mails offers immediate feedback to the sender.
- A single E-mail can be sent to multiple recipients at the same cost.

- A single E-mail can be sent to multiple recipients at the same time.
- E-mail is less susceptible/prone to loss.
- E-mail services facilitate management of stored mails.
- E-mail can be sent anywhere at any time as long as there is active network.

Any 3x1=3 marks

(b) Advantages of post-mail services over e-mail communication.
- There are lower chances of eavesdropping with post-mail service.
- Legal documents with original signatures can be sent using post-mail service.
- Physical messages can be sent by post.
- No loss of mail due to virus attack.
- Documents can be tracked during transit.
- Possibility of checking documents before sending, during transit or the destination for security.
- It is convenient for all categories of people.

Any 2x1=2 marks

17. **Examples of networking devices.**
- Network Interface Card (NIC)/Network Adaptor
- Modem
- Hub
- Switch
- Router
- Wireless Access Point (WAP)
- Repeater
- Bridge
- Multiplexer
- De multiplexer
- Concentrator/terminator

Any 5x1=5 marks

18. **Ways in which students use internet.**
- Communication through e-mails, voice over IP, on-line chat, telephony
- Online education through virtual classes,
- Online discussion, forums
- Online research trough Online library/learning materials like text books - Access to simulated experiments/behaviors.
- Web-based training/assessment.
- Virtual storage/online storage.
- Online collaboration

Any 5x1=5 marks

19. **(a)   (i)   Definition of data transmission media.**

- It is a path through which data signals are transferred/conveyed from one point to another.

1 mark

(ii)   Examples of transmission media.

- Micro waves
- Radio waves -
  Infrared rays -
  Gama rays.

- X-rays
- Coaxial cables.
- Twisted pair cables
- Fiber optic cable

Any 2x1=2 marks

(b)   Services offered by data communication tools.
- E-mails
- News groups
- Chat rooms
- Video conferencing.
- Telecommunication/teleconferencing.
- Instant massaging.
- Telemedicine
- E-learning
- E-commerce

Any 2x1=2 marks

20. **(a)   Services using E-payment method.**
- Banking
- Education
- Health / medical services
- Transport
- Online trade
- Insurance
- Civil service
- Entertainment
- Revenue collection
- Communication
- Utility

Any 2x1=2 marks (b)   Advantages of using E-payment over traditional methods.
- Quick delivery of money.
- Transaction can be done at any time.
- It is more secure since there is no physical handling of money.
- It is efficient in terms of cost and time.

- Reduced counterfaite

Any 3x1=3 marks

End

Name: …………………….....…………………… **Centre/Index No:**

Signature:

……………………………………...

Uganda Advanced Certificate of Education

SUBSIDIARY ICT

Paper 1

2 hours 30 minutes

1. (a) What is **a device driver**?   (01 mark)

A device driver is a program that controls a particular type of device that is attached to a computer by converting the more general input/output instructions of the operating system to messages that the device type can understand.

Are program files that enable one of more hardware devices to communicate with the computer's operating system.

Any 1x1 = 1mark.

(b) State **two** peripheral devices that may require installation of a device driver.
                                                        (02 marks)

- Printers   - Keyboard   - Monitor   - MODEM

- Scanners   - Mouse   - Digital camera

- Web camera.   - Card reader   etc.   *Any 2x1 = 2marks.*

(c) Outline **two** examples of windows operating system. (02 marks)

- Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10.

Any 2x1 = 2marks.

2. A problem with some computers in the computer lab was reported to a lab technician. Two of the technician's recommendations were for the school to install gadgets to regulate temperatures, and also buy a woolen carpet for the computer laboratory.

   (a) Suggest the gadget that they can buy in order to regulate room temperature.
   (01 mark)

   - Air conditioner / Fans.

   - Dehumidifiers. *Any 1x1=1mark.*

   (b) Give **two** reasons to explain why the gadget suggested in 2(a) above is required in a computer room. (02 marks)

   i. To regulate temperature in the computers room.

   ii. To absorb moisture. iii. To control dust in the lab. (c)

   State **two** benefits of a woollen carpet in a computer laboratory.

   (02 marks) i. Control dust.

   ii. Absorbs moisture that prevents the buildup of static electricity.

   iii. Acts as insulator to broken/live electric cables.

3. State five activities that can be performed on a computer using a mouse. (05 marks)

   -Pointing. -Highlighting.

   -Clicking. -Selecting an item.

   -Dragging/ Dropping. –Scrolling a bar. *Any 5x1= 5marks*

4. a) Give the function of the following keyboard keys. (05 marks)

   Caps Lock key
   - Changes letter casings from Lower to Upper and vice versa.

   Shift key
   - Used with other keys to type the symbol shown in the upper part of that key.

Tab key

- This key moves the cursor several spaces forward.

Ctrl key

- Used to produce control characters.

Alt key
  - Used to produce control commands.

5. State whether the following are **TRUE** or **FALSE.**   (05 marks)

	Statement	TRUE/FALSE
1.	A slot is found on the motherboard of a computer	TRUE
2.	Winrar is a utility software	TRUE
3.	POST helps to check if hardware is properly functioning and connected	TRUE
4.	System clock speed records the current data and time speed on the monitor	FALSE
5.	Primary key in a database table causes data redundancy	FALSE

6. (a) There are various forms of data communication which includes the both guided and unguided transmission.

   (i) What is a guided transmission?   (01 mark)

   - Is a process of transmitting signals through a physical medium / restricted path. i.e.

     through cables.

   (ii) Give any two examples of unguided transmission.   (02 marks) i.

       Radio transmission ii.   Microwave transmission iii.   Satellite transmission iv.

       Bluetooth transmission

   v.   Wi-Fi transmission   *Any 2x1 = 2marks.*

(b) Distinguish between modulation and demodulation as applied to data transmission.

(01 mark)

- Modulation is a process of converting analog signals into digital form while Demodulation is a process of converting digital signals back to analog form.

(c) Identify the device that can carry out both activities in (b) above. (01 mark)

- MODEM

7. (a) Distinguish between **mail merge** and **word wrap** word processing concepts.

(02 marks)

Mail merge is a word processing feature that allows users to combine two files (documents) into a single one while word wrap is a word processing feature that automatically move text to the next line.

(b) State any **three** advantages of using electronic word processors. (03marks)

i). It enables editing without retyping.
ii). Word processors allows users to make many copies of the same document.
iii). Word processors allow user to manipulate text through copying & pasting.
iv). It enables mass production of documents i.e. mail-merging.
v). Provides faster proof reading capabilities.
vi). Enables autocorrect features for error corrections.

8. (a) What is **an e-mail**? (02marks)

- Is a digital / electronic message exchanged from an author/ sender to one or more recipients across the internet.

(b) Below is a capture of an email window. Study it carefully and answer the questions that follow.
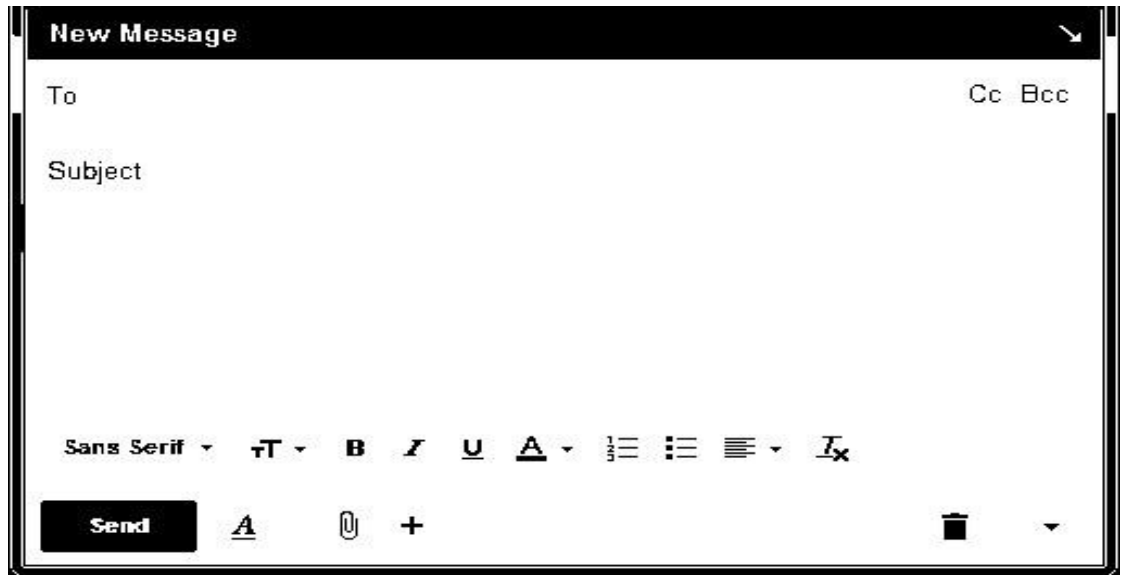
State the purpose of the following   (03marks)

   i.   **To:**   is where the address of the recipient is typed. ii.

   Subject: refers to the theme/topic of the e-mail.

   iii.   allow users to add file/files to be sent with the message

9. (a) Distinguish between **synchronous** and **asynchronous** data communication modes

(02marks)

Synchronous mode of communication is where characters are sent as blocks of signals **while** asynchronous communication mode is where each group of digital or analog signals make up the code for one character is separated and individually and sent one at a time across communicating devices.

(b) State **one** area in each case, where the following data transmission modes can be used.

(03 marks)

Mode of transmission	Area of application
Full duplex	Cell phone calls, Land-line calls.
Half duplex	Security radio calls (WALKI TOKI).
Simplex	Radio and Television broadcast.

10. (a) Define the term computer servicing   (01 mark)

Computer servicing is a process of diagnosing, installing, configuring and maintaining computer systems and networks.

(b) Give any two items/materials that can be used to service computers in a computer laboratory. (02 marks)

- Antistatic wrist strap. – Wire cutters. - Cable ties. - Mild soap.
- Screwdriver. – Lint free cloth. - Compressed air. – Dust Blower. - Digital multimeter. – Antivirus - Scandisk or Chkdsk. etc.

Any 2x1=2marks.

(c) Explain any two importance of servicing computers. (02 marks)

i. To prolong the life of hardware. ii. To pre-empt problems that may hinder the proper performance of the computer systems.
iii. To update outdated software programs. iv. To repair PC components.
v. To schedule backups. vi. To create restore points OS.
Any 2x1 = 2marks.

11. Mr. Odil, a computer illiterate teacher was informed of the new ICT equipment and among these were the biometric devices which he had no idea about. He later seeks your help. As an ICT student,

(a) What are **biometric** devices? (01 mark)
- Is a security identification and authentication device that uses physiological or behavioral characteristics like finger prints, facial images, iris and voice recognition.

(b) Mention any **three** biometric devices that they might have informed him about. (03 marks)

i. Iris recognition equipment.
ii. Finger print scanners. iii. Voice recognition equipment. iv. Face recognition equipment.
v. DNA or Blood test by blood bank etc. *Any 3x1 = 3marks.*

(c) Explain any one disadvantage of using biometric devices (01 mark)
- The systems are not 100% accurate.

- Require integration or additional hardware.

- Cannot be reset once compromised.

- Environment and usage can affect measurements.

12. (a) Define the following terms;   (03 marks)

Wiki
  - A wiki is a website that allows collaborative editing of its content and structure by its users.

Web portal
  - This is an internet based website that can perform many electronic functions and provide the user with quick access to a variety of information and services.

Blog
  - A blog is a discussion site published on the World Wide Web and consisting of discrete posts typically displayed in reverse chronological order.

(b) State the type of organizations with the following top level domains.   (02 marks)

   .mil – Military.

   .ac – Academics.

13. (a) Distinguish between a transfer rate and access time as applied to secondary storage devices   (02 marks)

   - Transfer rate is the speed at which data, instructions and information move to and from a storage device and computer memory **while** access time is a measure of the amount of time it takes a storage device to locate and item on a storage medium.

(b) Explain any three ways of caring for CDs and DVDs.   (03 marks)

   i.   Do not expose the disc to excessive heat or sunlight.
   ii.   Do not stack discs.
   iii.   Do not touch/ write on the underside of the disk. iv.   Do not bend the disc.
   v. Do not drop the disc to the ground.

14. (a) What is a software version?   (01 mark)

- A software version is a new updated software released from the earlier release of the same software.

(b) Software is easily known to be affected by computer viruses which corrupt almost all files and other software to hinder their functionality. Define a computer virus?   (01 mark)

A computer virus is a malicious code/ program designed to infect and disorganise the normal function of the computer system.

(c) Describe any two symptoms of computer viruses to software and hardware.   (02 marks)

    i. Computer runs slower than usual.
    ii. Computer stops responding. iii.   Corruption of files in the computer. iv.   Usual error messages i.e. your disk space is running low.
    v.   Disk drives and other system resources become inaccessible.   *Any 2x1 = 2marks*

(d) State any one antivirus program you know.   (01 mark)
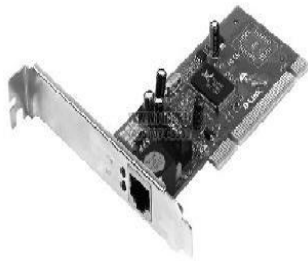
    - Kaspersky, Avira, Avast, Norton, Smadav.   *Any 1x1 = 1mark*

15. Identify the following devices and state the function of each.

DEVICE	NAME	FUNCTION
	Microphone.	Used to input voice signals.
	Wireless Access Point or Access point.	Connects wireless communication devices together to form a wireless network.

	Network interface card	Provides an interface between the network operating system and the networking devices.
	System Fan	Used to cool and regulate processor temperature.
	CD-RW Drive	Used to read from and write to CDs and DVDs.

16. What is recent in the minds of most Ugandans in IT world is *digital migration*
   (a) Briefly describe the concepts of

   i. **Digital divide.**   (01 mark)

      - Digital divide is a term that refers to a gap between demographics and regions that have access to modern information and communications technology and those that don't or have restricted access.

   ii. **Digital migration.**   (01 mark)

      Digital migration is a process of moving from analogue to digital broadcasting

   (b) State **three** benefits Uganda has drawn from digital migration.   (03 marks)

   i.   It has free spectrum for other uses e.g. wireless broadband, telephony etc.

   ii.   Digital migration enabled interactive video and data services that is not possible with analogue technology.

iii.   It has promoted efficiency in bandwidth usage iv.   Delivers high quality images than analogue technology.

v.   It provides automatic tuning and selection of channels. Etc.   *Any 3x1 =3marks.*

17. (a) Differentiate between **a server** and **a client computer.**   (02 marks)

A server is a computer on a network that controls and manages the network resources, making them available to its clients **while** a client computer is a computer that is connected to the network server to receive services from the server.

(b) What is the function of each of the following network devices?   (03 marks)
 i. Switch

- A switch is a high speed device that maintains a bridging table, keeping track of which addresses are located on which network segments.

- Is a device that forwards and filters chunks of data communication between ports based on the MAC Addresses in the packets.

 ii. Router

- A router is a device that links one network to other physically and logically separate networks.

 iii. Bridge
- A bridge is a device that links two local area networks that use the same address method or protocol.

18. Use the term below to complete the sentences that follow in (a)-(e).
      (05marks) Slides transition.   Animation effects.   Slide layout.
      Slide design.   Slide show.   Slide master.
      Handouts.

 a. The visual movement from one slide to another slide is Slide transition.

 b. The Animation effects set up the way text/objects appear on a slide during presentation.

 c. The presentation of slides in a sequence on a projection screen is referred to Slide show.

 d. The Slide master defines the arrangement of all items that makes up a slide.

 e. A user can print the entire presentation on one page by printing the Handouts.

19. (a) Define the following as used in the file management system.   (02 marks)

  i. **File path.**

   A file path specifies the unique location of a particular file in a file system.

  ii. **File extension.**

   File extension is a suffix at the end of a file name which identifies the type of file it represents.

(b) Using Windows 7 Operating System, outline the steps taken to create a folder in DOCUMENTS called **pre mock.**   (03 marks)

   - Right click empty portion in documents.
   - Select new from the drop down menu.
   - Select folder.
   - Give the folder a name i.e. pre mock.

20. (a) Briefly describe the concept of computer ethics.   (02 marks)

  Ethics is a set of moral values or principals that govern the conduct of an individual or a group.

(b) State **three** unethical practices usually engaged in by ICT users.   (03 marks)

  i. Plagiarism   iv. Cyber terrorism
  ii. Software piracy   v. Hacking. iii.   Copy right
  infringement

END.

**UGANDA ADVANCED CERTIFICATE OF EDUCATION
SUBSIDIARY ICT PAPER I**

1. (a) Distinguish between data and information   (2 Marks)
    (Any 2x1=2 marks)
    ✓ *Data are streams of raw facts with little or no meaning whereas Information is simply processed data or data which has been turned into a meaning full form.*

(b)Explain the importance of the three basic parts of the computer (3 Marks)

(Any 3x1=3 marks) any 3 hardware components and their uses

➢ *Computer Case/system case/system unit. The computer case is the metal and plastic box that contains the main components of the computer. It houses the motherboard, central processing unit (CPU), the power supply, and more.*

➢ *Monitor. The monitor works with a video card, located inside the computer case, to display images and text on the screen. Newer monitors usually have LCD (liquid crystal display) or LED (light-emitting diode) displays.*

➢ *Power Cord. The power cord is the link between the power outlet and the power supply unit in the computer casing. If the power cord is not plugged in, the computer will not power on.*

➢ *Keyboard. The keyboard is one of the primary ways we communicate with the computer and enter data.*

➢ *Mouse. The mouse is a peripheral that is known as a pointing device. It lets you point to objects on the screen, click on them, and move them.*

2. (a) What is a computer competency? (1 Mark)

(Any 1x1=1 mark)

➢ *is a process whereby a student/somebody can demonstrates his or her ability to perform school level basic computing work.*

➢ *Applying skills with computers to meet information needs*

(b) Explain the four basic steps of the computer processing cycle (4 Marks)

(Any 4x1=4 mark) (explain steps in their order from input, processing, storage to output.

➢ *Input – raw data that is entered into a computer*
Examples of Input – letters or numbers entered on a keyboard, mouse click on a icon, photos, videos songs. Input devices: Keyboard, mouse, scanner, microphone

➢ *Storage – when the computer save data, either in short term storage or long term storage .Example of Storage – saved file, keyboard information stored in RAM. Storage devices: Hard disk drive, flash drives, CD/DVD disks, RAM, or ROM*

➢ *Processing – when the computer is turning raw data into meaningful information. Example of processing – add two numbers together; display a picture on the screen. Processing devices: CPU, central processing unit and now the video adapter.*

➢ *Output – sending the feedback (information) to the user. Example of Output – the number is displayed after addition, document is printed. Output devices: Monitor, printer, speakers.*

3.   Explain the step of restoring a computer to an early date   (5 Marks)

➢ *Click the windows start button*
➢ *Select control panel from the menu*
➢ *Click on system*
➢ *Select advanced system settings*
➢ *Dialog box appears for system settings appears select system protection.*
➢ *Select Restore*
➢ *System restore dialog box appears click next.*
➢ *Select restore date and click next.*
          Or
➢ *Click windows start button*
➢ *In search window type system restore*
➢ *Select system restore.*
➢ *System restore dialog box appears click next.*
➢ *Select restore date and click next.*

4. (a) In file management distinguish between save and save as   (2 Marks)
    (Any 2x1=2 mark)
    ➢ *"Save" simply saves your work by updating the last saved version of the file to match the current version you see on your screen while as "Save As..." brings up a prompt to save your work as a file with a different name.*
    ➢ *Save is used to make changes to an existing file while save as is used to save/ store a file with new name*

 (b) Briefly Describe a fragmented file   (2 Marks)
 (Any 2x1=2 marks)
    ➢ *Is a file whose information is spread / scattered all over the storage media rather than sitting in one little section.*

 (c) What is a file extension?   (1 Mark)
 (Any 1x1=1 mark)

> *A string of characters attached to a filename, usually preceded by a full stop and indicating the format of the file.*

5. Describe how you can create a folder on local disk C (5 Marks)

(Any 5x1=5 mark) when the first step is wrong, all steps proves to be wrong too

> *Double click my computer*
> *Double click local disk C*
> *Right click anywhere on local disk C*
> *Select New*
> *Then select folder.*

6. (a) Differentiate between a serial port and parallel port (2 Marks)

(Any 1x2=2 marks)

> *Serial ports are types of ports where data is transferred one bit at a time while parallel ports transfer several bits at a time.*
> *Parallel ports transmits for short distance while serial port transmit for fairly long distance, up to 15M*
> *Parallel port transfers data more faster rate while a serial port transmits data at a slow rate.*

(b) Give an example and define the following terms (2 Marks)

(i) Optical storage media *(Any 1x1=1 mark)*

> *It's a storage media which use laser beams of light to read and write data.*

> *Optical storage media is a light readable media, where Data is recorded by making marks in a pattern that can be read back with the aid of light, usually a laser beam of light precisely focused on a spinning optical disc e.g CDs,DVDs etc.*

(ii) Solid state storage media *(Any 1x1=1 mark)*

> *Solid-state storage media is a storage device made from silicon microchips/ integrated circuits. Solid state storage media stores data electronically. Example Memory cards, Flash disks, smartcards.*

(c) What is a key board? (1 Mark)

(Any 1x1=1 mark)

> **A keyboard is a hardware text input device used to enter data in the computer.**
> **This is a primary input device which is composed of keys used to enter data in the computer usually in form of text.**

7. (a) Mention four reasons why an LCD monitor is preferred than a CRT Monitor
   (Any 4x1=4 marks)   (4 Marks)

Slim Factor	Bulky, the back size is proportionate to the size of the monitor	LCDs are much slimmer than their CRT counterparts. So it saves space and its portable.
Radiation	CRTs emit electromagnetic radiation. Radiation still passes through the screen and some people regard them as hazardous.	LCDs emit a very small amount of radiation compared to CRTs. Health conscious consumers prefer them for this one reason.
Weight	CRTs weigh heavier, especially in their front (the display area)	LCDs are very light, hence being portable.
Power Requirements	Higher power usage, more than 200% to an LCD of equivalent size.	Considerably lower power usage. 17 inch LCD requires around 35 watts.
Glare	Glare is reduced by the use of special filters and treated glass.	Little or no glare its inbuilt you can easily reduce the light.
Display Sharpness	The quality of picture is poor compare to that of LCD	Sharper and the quality of picture is good.(resolution)
Refresh Rate (Screen Flicker)	A minimum of 75hz is required for a flicker free image. All CRTs already support this, except at ultra high resolutions 2048++.	LCDs do not "paint" their image. They provide a flicker free image every time.
Warmness	Back gets noticeably warm after some time	Little warmth experience

(b) List one advantage of using a compact disc other than a floppy disc
(Any 1x1=1 mark) (1 Mark)
➢ **CDs are not prone to virus attack as the case of floppy disk.**
➢ **The cost of storing data on a CD is very low in terms of costs per megabyte compared to that of a floppy disk.**
➢ **CD's have a much higher capacity than floppy disc.**
➢ **Data access time of CD's is higher than that of floppy discs.**

8. (a) Briefly describe how the following function
     (i)   Optical mark recognition   (2 Marks)
     (Any 1x2=2 marks)
     ➢ **Optical mark recognition (OMR) devices read hand-drawn marks such as small circles or rectangles. A person places these marks on a form, such as a test, survey, or questionnaire answer sheet. The OMR device first reads a master document, such as an answer key sheet for a test, to record correct answers based on patterns of light.**

     (ii)   Optical character recognition   (2 Marks)
     (Any 1x2=2 marks)
     ➢ **Optical character recognition (OCR) is a technology that involves reading typewritten, computer-printed, or handwritten characters from ordinary documents and translating the images into a form that the computer can understand.**

(b)What is a biometric device? (1 Mark)
(Any 1x1=1 mark)
     ➢ **is a security identification and authentication device, which uses automated methods of verifying or recognizing the identity of a living person based on a physiological or biological characteristic. These characteristics include fingerprints, facial images, and iris and voice recognition.**
     ➢ **OR these are devices which can capture human body features and translate them into digital/electronic form which can be entered in the computer.**

9. Explain any five resources that are managed and controlled by the operating system　　*(Any 5x1=5 marks)*

Key Resource	OS Program
Processors	Processor Scheduling
Storage	Memory management
I/O devices	I/O management
Data	File management
Application software	Software Management

10. Write the file extension for the file mention in the table below (5 Marks) *(Any 5x1=5 marks)*

Description	Extension
A video/Audio file	.avi,.mpg,.flv,.wmv.mp3/4,.wav, .mpeg
An image file	.jpeg,.gif,.bmp,.png,.ppm,.raw
A Microsoft word document file	.doc,.docx
Files containing a series of commands loaded during boot	.exe,.dat,.app, .bat
System files that perform fundamental operations in a computer	.sys,.dll,.fmp

11. (a) What is a software suit?　　　　　　　　　　　　　　(1 Marks)

- *A software suite also called an application suite or productivity suite is a collection of two or more <u>software programs</u> that are bundled and sold together.*
- *A software suite or application suite is a collection of <u>computer programs</u> usually <u>application software</u> or <u>programming software</u> of related functionality, often sharing a similar <u>user interface</u> and the ability to easily exchange data with each other.*

(b) Explain why an operating system may fail to boot
    (2 Marks)

(Any 2x1=2 marks)

> *Effect of a computer virus which may have tempted with system files (boot sector virus).*
> *Incorrect Bios sequence. BIOS is a program which works to find a bootable hard drive based on its boot device order when a computer is started.*
> *Damaged Hard Disk or Partition. Provided that the hard disk or partition is damaged, "disk boot failure" error will occur as well.*
> *Hard drive Not Properly Plugged in. Apart from misconfiguration, if your hard drive is not properly plugged in, it will not be able to get connected to your computer successfully, which will also cause the "disk boot failure" error.*
> *Software Conflicts with System Settings. Sometimes, after you install any third party software and restart PC next time, you may receive such an error as well. In such a case, there are great chances that the software is conflicted with your system.*

(c) List any two likely solutions to the problem in 11(b) above
    (2 Marks)

(Any 2x1=2 marks)

> Solution (Boot *sector virus*). Install a fresh copy of OS with updated anti-virus.
> Solution (*in correct Bios Sequence*): In this case, you can change the BIOS boot order. When restarting your PC, open the BIOS, and then turn to the Boot tab. next change the order to ensure the internal hard drive is the first boot option. Finally save the settings and start your PC again.

> Solution (***Damaged Hard Disk or Partition***): Under this circumstance, you had better replace the drive and reinstall your Windows operating system right now.

> Solution (***Hard drive Not Properly Plugged in)*** In this case, you can power off your PC and then check the connection of the hard drive and motherboard. After confirming that all are correct, you can try to run your Windows again.

12. (a) Define the term Electronic mail   (2 Marks)
    (Any 1x2=2 mark)
  - ***Electronic mail (email) refers to the use of communication software to send and receive messages through a network.***

   (b) Explain the three basic elements of an e-mail compose window
      (3 Marks)
       (Any 3x1=3 marks)

> ***To(Recipient email address.): carries the address of the recipient.***
> ***cc: Enables copies of the E-mail message to be sent to the third party while acknowledging other recipients.***
> ***Bcc: Enables copies of the e-mail message to be sent to the third party without acknowledging any other recipients (if present)***
> ***Subject. Subject is a description of the topic of the message and displays in   most email systems that list email messages individually.***
> ***Sender (From). This is the senders Internet email address.***
> ***Date and time received (On). The time the message was received.***
> ***Reply-to. This is the Internet email address that will become the recipient of   your reply if you click the Reply button.***
> ***Attachments. <u>Attachments</u> are optional and include any separate files   that may be part of the message.***
> ***Body***
> ***Forward***

13. (a) State three advantages and two disadvantages of using the internet today
      Advantages   ***(Any 3x1=3 marks)***

- ➢ *Information on almost every subject imaginable.*
- ➢ *Has Powerful search engines*
- ➢ *Ability to do research from your home versus research libraries.*
- ➢ *Information at various levels of study. Everything from scholarly articles to ones directed at children.*
- ➢ *Message boards where people can discuss ideas on any topic. Ability to get wide range of opinions. People can find others that have a similar interest in whatever they are interested in.*
- ➢ *The internet provides the ability of emails. Free mail service to anyone in the country.*
- ➢ *Platform for products like SKYPE, which allow for holding a video conference with anyone in the world who also has access.*
- ➢ *Friendships and love connections have been made over the internet by people involved in love/passion over similar interests.*
- ➢ *Things such as Yahoo Answers and other sites where kids can have readily available help for homework.*
- ➢ *News, of all kinds is available almost instantaneously. Commentary, on that news, from every conceivable viewpoint is also available.*
- ➢ *Can be used as a storage device(cloud)*

Disadvantages   *(Any 1x2=2 marks)*

- ➢ *There is a lot of wrong information on the internet. Anyone can post anything, and much of it is garbage.*
- ➢ *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. You can start surfing, and then realize far more time has passed than you realized.*
- ➢ *Internet has a lot of "cheater" sites. People can buy essays and pass them off as their own far more easily than they used to be able to do.*
- ➢ *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.*
- ➢ *It can be quite depressing to be on the internet and realize just how uneducated so many people have become in today's society.*

14. (a) Distinguish between a website and a blog   (2 Marks)
(Any 1x2=2 marks)
Website is a collection of related <u>web pages</u>, while a blog is an online journal or informational website displaying information in the reverse chronological order, with latest posts appearing first.

(b) Briefly explain how you would browse to the ministry of Education and

Sports website   (3 Marks)
(Any 3x1=3 mark)

> ***Open a web browser***
> ***Open a search engine of your choice.***
> ***Type the keywords of the ministry of education***
> ***Click the search button***
> ***Look for the website from the search results and open***

Or

> ***Open a browser***
> ***In the web address bar, type the address (URL) of the site.***
> ***And press enter***

15. (a) What is computer networking?   (1 Mark)
(Any 1x1=1 mark)
> ***Computer networking refers to the process of connecting computers and other devices in order to share resources.***

(b) What can your school benefit from networking of the school premises
(Any 4x1=1 marks)   (4 Marks)
> ***Speed. Networks provide a very rapid method for sharing and transferring files. Without a network, files are shared by copying them to storage media.***
> ***Cost. Networkable versions of many popular software programs are available at considerable savings when compared to buying individually licensed copies.***
> ***Security. Files and programs on a network can be designated as "copy inhibit," so that you do not have to worry about illegal copying of programs.***
> ***Centralized Software Management. One of the greatest benefits of installing a network at a school is the fact that all of the software can be loaded on one computer (the file server). This eliminates that***

need to spend time and energy installing updates and tracking files on independent computers throughout the building.

➤ *Resource Sharing. Sharing resources is another area in which a network exceeds stand-alone computers. Most schools cannot afford enough laser printers, fax machines, modems, scanners, and CD-ROM players for each computer and can easily be shared on the network.*

➤ *Electronic Mail. The presence of a network provides the hardware necessary to install an e-mail system. E-mail aids in personal and professional communication for all school personnel*

➤ *Flexible Access. School networks allow students to access their files from computers throughout the school. Workgroup Computing. Workgroup software (such as Microsoft BackOffice) allows many users to work on a document or project concurrently.*

➤ *Online learning*

16. (a) Explain the meaning of the term router?   (1 Mark)
    (Any 1x1=1 mark)
➤ *A router is a networking device that forwards data packets between computer networks of different types.*
➤ *A router is hardware device designed to receive, analyze and move incoming packets to another network.*

   (b) List any four factors that affect the rate of data transmission
         (4 Marks)
      (Any 4x1=4 marks)
➤ *Bandwidth of the transmission media.*
➤ *Type of transmission Medium*
➤ *Amount of data transferred.*
➤ *Protocols used for negotiation amongst others.*
➤ *Distance the data travels.*
➤ *Speed of the communication device(baud rate)*
➤ *Connection type (point-point / multi-point)*
➤ *Network traffic*

17.   (a) Illustrate two elements of green computing with the help of examples.
      (Any 2x1=2 marks)
   - *Reduce on the use of hazardous materials, eg use LCD monitors rather than CRT monitors*

- *Promote recyclability of materials. Take them to recycling centers.*
- *Maximize energy efficiency of a product during the product's life time. Use energy star technology, use LED bulbs*

(b)   List three ways of implementing green computing
(Any 3x1=3 marks)

➢ *Set the CPU and all peripherals to hibernate during extended periods of inactivity.*
➢ *Try to do computer-related tasks during contiguous, intensive blocks of time, leaving hardware off at other times.*
➢ *Switch off devices which are not in use.*
➢ *Use of energy saving devices such as liquid-crystal-display (LCD) monitors rather than cathode-ray-tube (CRT) monitors.*
➢ *Use notebook computers rather than desktop computers whenever possible.*
➢ *Use the power-management features to turn off hard drives and displays after several minutes of inactivity. Eg. Reduce the brightness of your screen*
➢ *Minimize the use of paper and properly recycle waste paper.eg, sharing information electronically*
➢ *Dispose of e-waste according to federal, state and local regulations.eg, take them to recycling centers*
➢ *Employ alternative energy sources for computing workstations, servers, networks and data centers.eg use of solar energy, bio-gas*
➢ *Use of bio-degradable materials when working with computers eg papers, soft boards*

18.   (a)Define the term cyber ethics   (1 Mark)
   (Any 1x1=1 mark)
➢ *Moral guidelines or acceptable behaviors followed when using internet.*

 (b) Mention four ways of protecting data on your computer   (4 Marks)
   (Any 4x1=4 marks)
      ➢ *Using of updated antivirus software*
      ➢ *Using of windows firewall*
      ➢ *Restricting entry to computer systems*
      ➢ *Educate users*
      ➢ *Encrypt all important data*
      ➢ *Use secure passwords*

> ➢ *Implement additional security checks (biometric devices)*
> ➢ *Restrict Plug and Play devices*
> ➢ *Use of possessed objects*

19.   The table below shows results of Bachelors of information technology
       extracted from spreadsheet application. Use it to answer the
   questions (a) to
       (c) below;

	A	B	C	D	E	F
1	Name	Course work	Test	Examination	Total	Rank
2	Ismeal	56	74	89	219	3
3	Lindah	82	45	85	212	4
4	Clarie	100	95	90	285	1
5	Tracy	90	90	65	245	2
6	John	60	57	80	197	5
7	Amina	38	77	62	177	6
8						

(a)   Write the formulae that was used to generate the totals (02 Marks)
       (Any 1x2=2 marks)
       =SUM(B2:D2)
       =(B2+C2+D2)
       =SUM(b2,c2,d2)
       =SUM(B2+C2+D2)
       =SUM(B2:C2:D2)

(b)   Write the formulae that was used in Cell F4 to generate the rank
       (Any 1x2=2 marks)   (02 Marks)
       =RANK(E2,$E$2:$E$7), or =RANK(E2,$E$2:$E$7,0)
(c)   If rows are sorted in ascending order by Test, who will be at the top of the
list? *(Any 1x1=1 mark)*   (01 mark)
       Linda with 45

UNNASE MOCK EXAMINATIONS

Uganda Advanced Certificate of Education
S850/1 Subsidiary ICT

Theory Paper marking guide

1. a) In which part of a computer system would the following processes be done:
i) Holding of firm ware

- **ROM chips**   (1 Mark)

....

ii) Logic and statistical computation

- **Arithmetic Logic Unit (ALU)**   (1 Mark)

....

iii) Holding of system configurations

- **CMOS Chip**   (1 Mark)

....

iv) Demonstration of data being processed   **(1 Mark)**
- **Monitor/VDU/screen**
- **Projector**

....

b) State **one** example of information for a school like yours
         (1 Mark)
- **Average age of a class**
- **Average arrival time of teachers**
- **Total teachers pay or school fees**
- **Average score of a class in a given subject**

- **School circular**
- **Anything that would come as a result of data processing**

....

2. a) As a student of ICT show ***three*** ways in which you would use ICT to improve the management of any sporting activity.

(Any 3x3 = 3 marks)
- **Use goal line technology and DVRs to adjudicate goal decisions and conflicts**
- **Use spreadsheets to make fixtures of matches**
- **Use spreadsheets to record, manipulate and position winners**
- **Use video cameras and drones to record games for reference purposes**
- **Use radios, internet and Tvs to relay match proceedings to the world of fans**
- **Use databases to take participants profiles.**

....

b) Briefly explain the following ICT concepts

i) Virtualization
(1 mark)
- **Creation of softwares (Apps) or ICT systems that simulate or work as physical products like radios, torches, watches, TVs, etc**

....

ii) Embedded ICT systems
(1 mark)
- **Involves integration of several ICT functions in one unit**

....

3. a) Describe the role of the following computer system utilities;
(3 marks)

i) Defragmenters
- **They reorganize several fragmented sector together**
- **They isolate bad media sectors from good ones**   **(Any 1x1 = 1 mark)**

....

ii) Cryptographers   **(1 mark)**
- **They secure data by making it not easy to be understood ordinarily without an encryption key.**

....

iii) Anti-virus utilities   **(1 mark)**
- **They scan, remove, deactivate or stop virus/malware activity and entry**

....

b) Briefly explain how a computer virus can fail a computer to boot.
(1 mark)

- **Viruses like boot sector viruses attack and destroy program starter files (.exe files) and linkers in operating systems, making it hard for them to start**

....

c) State **two** factors one would consider when buying a printer.

- **Printer speed – number of copies per minute**
- **Printer make and model**
- **Nature of work to be done**
- **Price of the printer against buyers budget**
- **Availability of printer drivers**
- **Compatibility issues   (Any 2x1 = 2 marks)**

....

4. a) Briefly describe how you would move a folder from drive D: to the desktop.

NB: it is about <u>moving</u> not <u>copying</u>. So

- **Locate the folder on drive D and cut it (by any method like Ctrl + X)**
- **Go to the desktop and Paste it (by any method – like Ctrl + V)   (2 marks)**

....

b) State **one** role of each one of the following default system folders;

i) My Documents folder   **(1 mark)**

- **It is a default folder for holding ordinary users files and folders**

....

ii) Program Files folder.

- **It is a default folder for holding system and apps files and folders (1 mark)**

....

iii) My Pictures and my music folders

- **It is a default folder for holding multimedia files, files and folders (1 mark)**

    ....

....

5. a) State **one** importance of ICT systems servicing.

- **Ensuring continued usage of ICTs without breakages**
- **Extending ICT use life span**
- **Saving costs of repair and buying of new devices early (Any 1x1 = 1 mark)**

....

b) Explain the use of the following tools in ICT systems maintenance.

i) Flat-head screwdriver:
- **Used to tighten or loosen slotted screws.** **(1 mark)**
....

ii) Flashlight
- **Used to light up areas that you cannot see well.** **(1 mark)**
....

iii) Cable ties
- **Used to bundle cables neatly inside and outside of a computer (1 mark)**
....

iv) A *digital millimeter*.

- **It is used to test the integrity of circuits and the quality of electricity in computer components.** **(1 mark)**
....

6. a) State *two* features of an ordinary keyboard
- **Function keys**
- **Arrow keys**
- **Cursor control keys**
- **Numeric key pad**
- **Shift keys**
- **Enter or return keys**
- **Space bar keys**
- **Typographic area** **(Any 2x2 = 2 marks)**
....

b) Give *one* example of scanning input devices.

- **OCR**
- **OMR**
- **Motion sensors**
- **Barcode reader** **(Any 1x1 = 1 mark)**
....

c) Give *one* reason to explain why a keyboard would not be treated as a peripheral device
- **A keyboard is a basic device which is central to the booting and functioning of the PC or ICT system. It does not just expand or increase functionality** **(1 mark)**
....

d) State **one** example of a cursor control key of the keyboard

- **Arrow keys**
- **Home key**
- **End key**
- **Page up key**
- **Page down key**
- **Delete key**
- **Backspace key**   **(Any 1x1 = 1 mark)**

....

7. a) Distinguish primary storage from secondary storage

- **Primary storage is any form of media or device that is important for the system to boot or work. Whereas secondary storage only supplements basic storage that even if it is not there the system can work**   **(1 mark)**

....

b) Give **two** examples of primary storage media
- **RAM**
- **Registers/Accumulators**
- **CMOS chip**
- **HDD**   **(Any 2x1 =2 marks)**

....

c) State **two** characteristics of any storage device and media
- **Access time**
- **Capacity/space**
- **Size**
- **Read and write technology**
- **Drive type – spinning or solid state**
- **Media type or name CD, DVD, Flash, Memory stick, etc.**
- **Location or media path.**
- **Nature of partition.**   **(Any 2x1 = 2 marks)**

....

8. a) One of the key components of a computer system is its Processor or CPU. As a learner of ICTs state one role of the CPU to the computer system
- **Fetching of instructions or commands:** Instructions are stored in memory and have their own addresses.
- **Decode** The CPU translates programs into Assembly instructions.
- **Execution of commands:** In this, the CPU can do one of three things: Do calculations with its ALU, move data from one memory location to another, or jump to a different address.

- **Store** The CPU gives feedback after executing an instruction and the output data is written to the memory.   (Any 1x1 = 1 mark)

………

b) Give **one** example of a good processor for a graphics and animations designer.

- **AMD zen**
- **Core i7 and 5-6402P**
- **Intel Dual Core or Core2**   (Any 1x1 = 1 mark)

……………………………………………………………………………………………………

c) State **one** example of ICT device or innovation that would be used to perform each one of the following activities:

i) Decide the paternity of a child

- **DNA Test kit**   **(1 mark)**

………

ii) Give the speed of an automobile

- **Motion sensor or speed gun**   **(1 mark)**

………

iii) Determine the warmth of an incubator

- **Temperature regulator**
- **Heat sensor**   **(1 mark)**

………

9. a) Software is said to be the **_artificial intelligence_** of an ICT system. Briefly explain why software is said to be "**_artificial intelligence_**".   **(1 mark)**
Because it is man-made intelligence by an ICT professional called a software engineer

……………………………………………………………………………………………………

b) State **one** other characteristic feature of software apart from artificial intelligence

- **Software is intangible**
- **It is the system intelligence.**
- **It performs specific**
- **It is in a variety of forms**   (Any 1x1 = 1 mark)

(NB: the question is not looking at qualities of good software)

………

c) We are increasingly living in the world of Apps. What are Apps?
          (1 mark)

 Apps are various user specific softwares for performing user specific duties

………

d) Give two examples of Apps common in mobile devices

- **Browsing Apps like Google Chrome, safari, Mozilla Firefox, Google, etc.**

- **Document processing Apps like – Ms Word, etc**
- **Gaming Apps like Cue club, motor racing**
- **Social media Apps like face-book, messenger, Viber, etc**
- **Etc**   **(2 marks)**

....

10. a) Distinguish a software version from a release.

- **A release is <u>a minor upgrade</u> in a software product, while version is a <u>major upgrade</u> in a software product**
                   (1 mark)

....

b) State *two* characteristics of a failed operating system

- **Blurred screen**
- **Display of a blue empty screen**
- **Failure to complete the booting process**   **(Any 2x1 = 2 marks)**

....

c) Explain *two* factors one should consider when buying computerized devices software.
- **Purpose/function. Different softwares are suitable for different functions.**
- **Price**
- **Compatibility. Ability to run on different platforms**
- **Safety provisions**
- **Bugs free**
- **Nature of interface**
- **Amount of space occupied on storage media**
- **Efficiency and effectiveness**
- **Loads easily**
- **Upgradability**   **(Any 2x1 = 2 marks)**

....

11. a) One of the features that make a software user friendly is its interface. With some help of a relevant example, state the meaning of a software interface.
- **Interface refers to tools and systems through which users interact with the computer or ICT system. E.g.; icons, dialogue boxes, menu systems, command boxes, touch screens, voice recognition systems, etc.**   **(2 marks)**

....

b) Give two unique distinctive features of a spreadsheet application software interface.
- **Inbuilt functions and formulas**
- **Inbuilt rows and columns**
- **Worksheet tabs**

- **Inbuilt charts**
- **Data manipulation menu**   (2 marks)

....

c) Briefly show how computer hardware is different from computer software.

- **Hardware is physical, tangible or electromechanical, while software is intangible   (1 mark)**

....

12. a) One of the dangers of the internet and WWW is their controversial content. As a student of ICT;

i) Distinguish the Internet from WWW

- **Internet is a network while WWW is a set hyperlinked electronic documents.**
                                                                         (1 mark)

....

ii) Give **two** examples of such content that circulates through the internet

- **Slander**
- **Malware**   (2 marks)

....

iii) State **two** examples of The Internet and WWW communication and collaboration tools

- **E-mails**
- **Skype**
- **Internet telephone**
- **Google hangouts**
- **Google Docs**
- **Google drive**
- **Drop Box**

- **One drive**
- **Media fire**
- **Hipchat**
- **Slack**
- **Go ToMeeting**
- **Messenger**
- **Whatsup**

- **Cage**
- **InVision**
- **Logo Maker**
- **Online websites**
- **Zoho**
- **Etc**

                                                                (Any 2x1 = 2 marks)

....

13. a) Research is **one** of the kilos of The Internet and WWW. As their ardent fun state one of their tools that can support the following;

i) Research:

- **Online e-books like encyclopedias**
- **Search engines**
- **Etc**

- **Online dictionaries**
- **Online journals or periodicals**
- **Various websites like blogs**
                                                                (Any 1x1 = 1 mark)

....

ii) Business
- **Online banking and funds transfer systems that facilitate payments**
- **Websites for business promotions/adverts**
- **Business websites – like Tradecar view, Everbuying and Amazon.**
- **Online courier service providers who facilitate movement of business documents (Any 1x1 = 1 mark)**

………………………………………………………………………………………………
…………………………………………

iii) Entertainment and leisure:
- **Online E-zoos**
- **Online movies and video sites like YouTube**
- **Online music sites – like mudundo.com**
- **Online TV and Radio services**
- **Online dating sites**
- **Online pastoral/preaching sites (Any 1x1 = 1 mark)**

……………………………………………………………………………………………

b) State *two* factors a research firm would consider when choosing hosting service provider:
- **Bandwidth** - lots of graphics, dozens of pages, and large amounts of traffic, you're going to need decent bandwidth and disk space.
- **Compatibility** – like supported operating systems
- **Reliability and availability** - looking at site "Uptime."
- **Security** – like host firewalls, daily backups, and user authentication (Any 2x1 = 2 marks)

………………………………………………………………………………………

14. a) Explain how a student would make use of the following tools in his/her academic work:

i) Messenger and whatsup

Students would;
- **Update themselves about missed lessons**
- **Share electronic notes and other electronic study resources like practical videoz**
- **Forward assignments**
- **Make any academic inquiries (Any 1x1 = 1 mark)**

………………………………………………………………………………………………………

ii) Discussion board

- **Students would use the facility to share research and knowledge about curriculum or subject topical issues**
        (Any 1x1 = 1 mark)

....

iii) News group
- **Update themselves about missed lessons**
- **Share changes in timetables and new topics or coverage**
- **Make any academic inquiries** **(Any 1x1 = 1 mark)**

....

b) State **one** quality of a good website

- **Not biased – Has appropriate content**
- **Quick response – Fast download and upload**
- **Easy to navigate**
- **Well updated**
- **Appropriate design – Appropriate colour balance, variations and readable data (text and images)**
- **A good administrative tool for tracking visitors/hit counters, frequently used, downloads, etc.**

                                        (Any 1x1 = 1 mark)

....

c) Distinguish a **podcast** from a **hit counter**
        (1 mark)
- **Hit counter or web counter: Indicates the number of visitors, or hits, a particular webpage has received in a time. While** a podcast is a digital audio file or radio series made available on the Internet for downloading to a computer or mobile device.

....

15. a) A good document must be well processed, referenced, and retrievable. As a student of ICT;
i) Define document referencing **(1 mark)**

- **Document referencing is the provision of pertinent details for consultation about a phrase, word or topic in a document.**

....
....

ii) Give **two** document referencing tools

- **Endnote**
- **Footnote**
- **Table of contents**
- **Index**
- **Caption**

- **Bibliography**
- **List of figures and tables**

(Any 2x1 = 2 marks)

....

b) Give **one** common feature of document processors

- **Word wrap**
- **Mail merge**
- **Document creation, editing, saving and printing tools**
- **Document copying, pasting, moving and text deleting tools.**
- **Document text formatting for font type, bolding, underlining or italicizing.**
- **Table Creation and editing.**
- **Inserting elements from other software, such as illustrations or photographs.**
- **Correction of spellings and grammar tools**
  (Any 1x1 = 1 mark)

....

c) Name **one** form of document layout

- **Print layout**
- **Web layout**
- **Outline layout**
-

- **Drafts layout**
- **Full screen layout**

(1 mark)

....

16. a) i) One of the most greatly abused software is presentations and desktop publishing software. As a student of ICT state **two** qualities of a good presentation/ Publication **Appropriate contrasts for colors and font**
- **Appropriate animations**
- **Appropriate content**
- **Relevant graphics**
- **Page or page balance of content**
- **Correct spellings, punctuations and grammar**
- **Appropriate layout**   **(Any 2x1 = 2 marks)**

....

ii) Distinguish presentation from desktop publishing software

- **Presentation software presents work in form of slides while DTP software uses in built templates for publications**
  (1 mark)

....

b) State *one* tool that can help in the navigation of a presentation during a slide show
- **Hyperlinks**
- **Action buttons**
- **Remote control sensors**   **(Any 1x1 = 1 mark)**

....

c) Give *one* example of publication that can be created with Desktop Publishing Software.

- **Calendars**
- **Fliers**
- **Certificates**
- **Web pages**
- **Labels**
- **Catalogues**

- **Letter heads**
- **Brochures**
- **Postcards**
- **Newsletters (Any 1x1 = 1 mark)**

....

17. a) Data transmission media can be guided (wired) or unguided (wireless). As a student of ICT;
i) Distinguish between guided and unguided data transmission media

- **Guided uses wires or cables for data transmission while unguided uses wireless transmission technology to as data pathways**   (1 mark)

....

ii) Give *one* example of unguided data transmission media

- **Broadcast radio waves**
- **Cellular radio waves**
- **Infrared waves**
- **Communications satellite**
- **Microwaves.**   **(Any 1x1 = 1 mark)**

....

iii) Of the many guide data transmission media choose one with a supporting reason for use in your school.

- **Fiber optic cable – because of its faster data throughput   (2 marks)**

....

b) Show how you would distinguish simplex from full duplex data transmitters. **(1 mark)**
- **Simplex transmitters only allow data to move in one direction at all times while full duplex transmitters can allow data from any direction at any time**

....

18.a) Study the function structure below and answer its related questions.

=IF(D2<80,No Money,50000)

i) State the reason for using equal signs at the beginning of the function structure. **(1 mark)**
- **It is a programmed spreadsheet instruction that initiates a function or formula**

....

ii) State the category into which the above function falls

- **Logical function**   **(1 mark)**

....

iii) State whether the above function will run or not when executed. Give the reason for your answer.

- **It will not run because a label "No Money" is not in quotation marks (2 marks)**

....

b) Explain *one* feature of good database design

- **Avoided data redundancy**
- **Minimized data restructuring**
- **Data integrity.**
- **Appropriate I/O transaction sizes**   (Any 1x1 = 1 mark)

....

19. a) State *one* application areas of data communication

- **Voice mail services**
- **Fax services**
- **E-mail services**
- **BBS services**
- **Instant messaging services**
- **Chart rooms services**
- **Newsgroups services**
- **Internet telephony services**
- **Video conferencing services**
- **Groupware services**
- **Telecommunicating services**
- **GPS services**

....
....

b) Give *one* factor that can influence the data transmission speed of any network

- **Transmission mode: asynchronous versus synchronous or Serial and parallel transmission**
- **Line configuration**: **Point to point and multipoint.**
- **Nature of transmission media**
- **Nature of transmitter**
- **Nature of data being transmitted like multimedia Vs. Text data**
- **Weather**
- **Timing – peak hours are typical of slow data movements   (Any 1x1 = 1 mark)**

....
....

c) State *one* role of each one of the following data transmission and networking devices:

i) Network interface card (NIC)

(1 mark)

- **A NIC connects a computer to a local data network or the Internet.**
- **It also translates computer data into electrical signals it sends through the network**

....
....

ii) MODEM:

(1 mark)

- **Interprets or changes computer binary data format for air space movement and vice versa**

....
....

d) Briefly describe *one* network model that can be adopted by your school networking team.

- **Peer-to-peer network model**
- **Client server net model**
- **OSI or Open System Interconnection: responsible for generating and promoting industrial and commercial standards applicable for all the users or universally.**
- **TCP/IP Model**   (Any 1x1 = 1 mark)

....
....

20. a) Distinguish between the following in relation with ICT;

i) ICT ethics from legal issues
   (1 mark)
* **ICT ethics are generally acceptable moral ICT behaviors, while legal issues are practices backed by sanctions in case they are done or omitted.**

....
....

ii) Hacking from cracking
   (1 Mark)
* **Cracking involves gaining advantage by tampering with the security and tracking system of a software product. While hacking involves gaining unauthorized access into an ICT system.**
....
....

b) State one emerging ICT trend in the field of education.
   (Any 1x1 = 1mark)
* **Interactive whiteboards replacing blackboards**
* **Electronic pens replacing chalk**
* **Digital books and documents replacing print media**
* **Computer based assessment replacing manual tools of the same**
* **Computer based simulations for physical practical sessions.**
* **Literacy now embracing the ability to create and respond to video, music and art as well as text.**
....
....

c) State *one* example of an ICT professional who would execute each of the following ICT professional works;

i) Write electronic instructions for computers to follow:
* **Software engineer/writer or programmer   (1 mark)**
....
ii) Design promotional clips for business organizations and individual people.

- **Animations and graphics designer**
        (1 mark)

....

WAKISSHA JOINT MOCK EXAMINATIONS
Uganda Advanced Certificate of Education
SUBSIDIARY ICT **Paper**
1
2 hours 30 minutes

1.   **Distinguish between Optical Character Recognition Reader (OCR)**
and Optical Mark Recognition Reader (OMR).   **(2 marks)**

*Optical character recognition (**OCR**) is a technology that involves reading typewritten, computer-printed, or handwritten characters from ordinary documents and translating the images into a form that the computer can understand.* **While**

*Optical mark recognition (**OMR**) devices read hand-drawn marks such as small circles or rectangles. A person places these marks on a form, such as a test, survey, or questionnaire answer sheet.*

b) **Explain three advantages Optical Mark Recognition Reader (OMR) over**
Optical Character Recognition Reader (OCR).   **(3 marks)**

- *With OMR, the image of a document is not scanned and stored.*
- *OMR is simpler than OCR.*
- *Designed properly, OMR has more accuracy than OCR.*

- *OMR can recognize checks and "X"s*
- *Requires timing tracks or form IDs*

2. a) Define the term web portal. (1 mark)

*A web portal is a specially designed website that often serves as the single point of access for information. It can also be considered a library of personalized and categorized content. A **web portal** is a specially designed website that brings information from diverse sources, like emails, online forums and search engines, together in a uniform way*

b) Suggest two applications of ICT in each of the following areas

i) Transport. (2 marks)

- *Use of the internet to pay vehicle insurance taxes online like URA*
- *Uganda Revenue Authority uses computers to store all vehicles and drivers databases and records*
- *Registration for drivers' license online*
- *Use of computerized fork lifters during construction of roads*
- *Use of computers and digital cameras to manage traffic jam*
- *Use of Google maps and related software for direction on roads like Uber application.*
- *Use of closed circuit televisions on roads to limit over speeding*
- *Police men use alcohol breath taking device to check for drunkard drivers.*

ii) Business. (2 marks)

- *Enable electronic commerce*
- *Facilitates faster communication*
- *Allows online banking*
- *Facilitates advertisement of business*
- *Enhances security on business premises*
- *Promotes research in business enterprises*

3. **Ali wants to back up his data**

a) **Give two reasons why making a backup is necessary. (2 marks)**

- *To protect your data from virus attacks*
- *To have a duplicate in case of hardware failure*

b) **Ali thinks that making backup will prevent his data from getting virus. Give one reason to support his answer.** **(1 mark)**

- *He will use the backup/duplicate when the original copy is infected*

c) **Suggest two ways of controlling viruses.** **(2 marks)**

- *Use of anti-virus software like Avast, AVG, Norton,*
- *Backing up of data*
- *Scanning of all removable storage devices before use.*
- *Avoid downloading files from untrusted sites from the internet*

4. a) Differentiate between copying and moving in relation to file management.

(2 marks)

Copying refers to the process of duplication of a file While Moving is the transfer of file from one place/location/position to another.

b) Give two properties of a folder. **(2 marks)**

- *Folder name*
- *Folder size*

c) Suggest keyboard buttons one presses to close any file open without clicking on the close button. (1 mark)

Alt+F4

5. a) Define the term burglar proofing. **(1 mark)**

This refers to the protection of the computer laboratory against any physical and forceful entry by intruders or burglars

b) Give two reasons for burglar-proofing. **(2 marks)**

- *They prevent the computer laboratory against intruders.*
- *They protect sneaking into and out the computer laboratory.*
- *They prevent forceful entry into the computer*
- *They limit access to the computer hardware of the laboratory*

c) Identify two computer hardware threats. **(2 marks)**

- *Hardware vandalism*
- *Hardware theft*
- *Virus attacks*
- *Fire outbreak*
- *High voltage*
- *Spilling liquids and water*
- *Rusting*
- *Magnetism to hard drives*

6. a) Mention two causes of system failure. **(2 marks)**

- *Hardware malfunction*
- *Virus attacks*
- *Denial of service attacks*
- *Short circuits*

b) State the difference between software upgrade and software update.

(2 marks)

Software upgrade: This is a process of replacing a product with a newer version of the same product. While

Software update: This is a software application that provides fixes for features that are not working as intended or adds minor software enhancements and compatibility.

c) Give one way system failure can be controlled. **(1 mark)**

- *Installing anti-virus to control against viruses*
- *Burglar proofing the computer laboratory to limit forceful entry*
- *Strict laws against opening computer system cases*
- *Providing stable by using surge protectors and UPS*
- *Installing firewalls*

7. a) Differentiate between traditional and electronic spreadsheets.

(1 mark)

Traditional spreadsheets are created on green ledger paper with a mechanical pencil. *While*

Electronic spreadsheet is a software program that allows the user to calculate, save and manage data in rows and columns.

b) Mention two qualities of a good graph.   (2 marks)

- *It should have a title.*
- *It should have X and Y axes labelled.*
- *It should give a good visual impression.*

c) Mention two disadvantages of electronic spreadsheet.   (2 marks)

- *They are susceptible to trivial human errors.*
- *Data accuracy is difficult*
- *Consumes a lot of time in validating and tracking data*
- *It can be extremely challenging to spot and correct errors especially with larger volumes of data.*
- *Keeping your spread sheet updated is also a hassle*
- *Limited user access*

8. a) Differentiate between standard and In-house packages.   (2 marks)

Standard packages are software programs already written and ready to be run upon their purchase. **While**

In-house are tailor made programs constructed to meet specific user requirements. They are specifically designed to meet user requirements.

b) Suggest the functions of the following utility programs.

i) Diagnostic utility.   (1 mark)

Diagnostic utility identifies a problem in the software/hardware, finds possible causes and gives possible solutions to the problem.

ii) Screen saver.   (1 mark)
Screen savers are utilities that prevent phosphor burn-in on CRT and plasma monitors by filling it with moving images, patterns when the computer is not in use.

c) Give one example of customized application software.   (1 mark)

- *Accounting software*
- *Banking software*
- *Online web applications*
- *School management systems software*

9. a) Define a firewall.   **(1 mark)**

Firewall refers to all software and hardware that is designed to limit access and protect the network from intruders or unauthorized access.

b) Give two advantages of using an internet at home.   **(2 marks)**

- *The Internet facilitates research at home*
- *Provides access to information*
- *Facilitates communication and social networking*
- *Promotes telecommuting*

c) You are given the following URL; www.wakissha.ug

Identify

i)   .ug   **(1 mark)**

Top-level domain name

ii)   .wakissha   (1 mark)

Domain name

10. Many companies use video conferencing instead of face to face conferencing.

Mention three advantages of video conferencing.   **(3 marks)**

- *Saves transport and travel costs to members*
- *Can be conducted at any time 24hours a day*
- *Saves time for participants for travelling to meet each other.*
- *Participants in different locations are able to work on the same edocument.*
- *Allows sharing of files and videos*

a) **Explain two disadvantages of video conferencing.** **(2 marks)**

- *A high band width communication link is required*
- *There is a short time lag between speaking and receiving responses*
- *High quality dedicated video conferencing systems are expensive*
- *Initial costs required to conduct and buy video conferencing materials like cameras*

11. a) Differentiate between transition loop and slide sorter facility.

(2 marks)

*A **transition loop** is a feature in a presentation program that allows the slide to move either continuously / repeatedly or to the final slide depending on the user defined settings. **While***
*A **slide sorter** makes it easy for you to sort and organize the sequence of your slides as you create your presentation, and then also as you prepare your presentation for printing*

b) Explain three qualities of a good presentation. **(3 marks)**

- *Use of clear fonts.*
- *Each slide should have a heading.*
- *Use of appropriate colours and fonts.*
- *Use minimal animations.*
- *Use few but relevant graphics / images.*
- *Should address needs of the user.*

12. Write short notes on each of the following in relation to data communication.

i) **Attenuation** **(1 mark)**

This is the process through which signals over a network reduce their strength commonly occurring while transmitting analog or digital signals over long distances.

ii) **Multiplexing.** **(1 mark)** *This is process of combining two or more input signals from various devices into a single stream of data and then transmits it over a single transmission medium.*

iii)   **Band width.**   **(1 mark)**
This is the amount data that can be transmitted in a fixed amount of time usually expressed in bits per second(bps) or bytes per second

iv)   **Half duplex.**   **(1 mark)** *Half-duplex transmission* allows data transmission in either direction, but only one way at a time. Many fax machines, police radio calls, credit card verification systems and automatic teller machines use half-duplex transmission.*

v)   **Repeater.**   **(1 mark)** *A repeater* is a device that accepts a signal from a transmission medium, amplifies it, and retransmits it over the medium.*

14.Suggest five services that can be provided an ATM machine.   (5 marks)

- *Withdraw of cash*
- *Deposit of cash*
- *Balance statement*
- *Change of PIN*
- *Balance inquiry*

15.Private data or information is a collection and use of personal information. This information should not be accessed or disclosed to any other person unless permitted by the owner.

a)   **Explain three concerns related to the collection and use of private**

and confidential data.   **(3 marks)**

- *Encryption data*
- *Hacking and cracking*
- *Plagiarism*
- *The source of data*

b)   **Describe the role of disaster recovery plan as a data protection**

measure.   **(2 marks)**

It allows you to recover and retrieve accidentally deleted data

16.   a) State the two factors to consider before buying a software

program. **(2 marks)**

- *Compatibility of the software with the computer*
- *Cost of the software*
- *Reliability of the software*
- *User-friendliness of thee software*

b) Mention three ways computer users can obtain software. **(3 marks)**

- *Through downloading from the internet*
- *Buying the software from manufacturer*
- *Designing the software by yourself*
- *Duplicating from fellow computer users*

17. Write the following computer acronyms in full.

i) MODEM. **(1 mark)**

Modulation Demodulation

ii) GPRS. **(1 mark)**

General Packet Radio Service

iii) VGA. **(1 mark)**

Visual Graphics Array/ Video Graphics Array

iv) PCI. **(1 mark)**

Peripheral Component Interconnect

v) CMOS. **(1 mark)**

Complementary Metal Oxide Semiconductor

18. a) Why is the binary number system used for computer? **(2 marks)**

This is because computers can only understand language written in binary/digital (0 and 1s) or machine language.

b) Convert 10101010 to its decimal equivalent. (3 marks)

19. a) Define the term digital forensics. (1 mark)

b)   Mention **two** causes of signal attenuation.   (2 marks)

c)   Mention **two** Biometric devices.   (2 marks)

20.   Why do you think there are still few people using computers in Uganda

today?   (5 marks)

END