

DIRECT TO POINTS

–The Examiners' Words–

**INFORMATION AND
COMMUNICATION TECHNOLOGY**

A Level Subsidiary - ICT



Third Edition

Summarized Notes + Questions and Answers

Author

Kichui Shadrack Enoch
ICT Dept. Seeta High School
Bsc. Computer Science,
Makerere University

Edited by:

Kaggwa Maurice
ICT Dept. Seeta High School
Bsc. Computer Science,
Makerere University

Revised by:

Kumakech Micheal
ICT Dept. Uganda Martyrs S.S. Namugongo
MSc. Data Communication &
Software Engineering - Makerere University

FORE WORD

This book, The **Examiners' Words**, is a result of heavily detailed text books and the information obtained from the Internet (the World Wide Web). The aim was to compile all the materials that are in line with Secondary Schools' syllabus around East Africa.

The comprehensibility of this manuscript is what makes it a necessary choice to any learner intending to sit UNEB subsidiary ICT at A' level examinations.

This text eliminates unnecessary details of non-usable materials to have learners focus on examinable points, thus saving a great deal of learners' valuable time.

A few diagrams are used to illustrate abstract explanations in various topics. Questions in every end of the topic that include objective and structured type questions are to be used by the learners to test their understanding throughout the text.

UNEB Marking Guides for A' level and others from different experienced teachers and Examiners are also included at the end of this Notebook. Hence **Examiners' Words**.

Computer related theory work may not be memorized like a fascinating newspaper article. All Examinees are therefore advised to go through this notebook on regular basis as well as attempting questions that are at the end of every topic without fail. In so doing, they will realize the inner depth values of this writing.

Learners pursuing A' level Subsidiary ICT should not ignore any topic, questions, or marking guides that are provided. Doing so is to limit him/herself from better understanding of this book.

Appeal

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2. The term Systems Unit

Perhaps, this should not have confused anyone but when the word “system” is mentioned, learners may take it to be **Computer System**. **System Unit** or **System cabinet** only describe components that are housed in the box cabinet such as **Hard disk**, **Power Supply**, **Motherboard**, and anything else found there can be listed and described.

3. Components of the CPU – The processor.

Sometimes, authors indicate only two, that is, **Control Unit** and **Arithmetic Unit**. Others add in **main memory**. To further make the life of the learners harder is when other authors include **Registers** and **Buses**. Depending on the architecture of the computer, actually, all authors are right. The current author’s aim is to guard against the situation where a learner is put in the cross fire where a trainer or examiner does not recognize some of the components in the CPU.

4. Unit for Measuring Capacity

Computer’s storage capacity is described in **bits**, **bytes**, **kilobytes** and so on. It is clear cut that eight (8) bits amount to a byte. But, **1024** byte (not 8 bytes) amount to a **Kilobyte**. And **1024** form a **Gigabyte** and so on. However, the area of contention here comes when the interval **1024** of bytes or kilobytes is compromised or approximated to **1000**. The advice of the author to all examiners is to indicate which

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interval should be followed by learners during conversion of one storage expression (say Megabytes) to another storage expression (say bytes).

Also, keep in mind that if you use the interval of 1000 instead of 1024, in case of large numbers, billions of bits or bytes may be left out.

5. Types of Printers

This part has several possible confusions. If not properly asked, questions related to this area can greatly confuse the examinees. For instance, printers can be classified with the way they send prints on paper, i.e. **Impact** and **Non-impact printers**. Secondly, printers can be classified according to the amount of characters sent on paper at a time, i.e. **Character Printers**, **line printers** and **Page printers**. Finally, types of printers can be taken as the way they are produced by different manufacturers such as **Laser printer**, **Ink jet printers**, **Dot matrix printers** and so on.

6. Programming languages

Programming language, if asked their types can also confuse examinees. For instance, it is possible for a posed question to write types of programming languages. In this case, one may write levels of programming language such as Machine Language, Assembly Languages, High level languages and so on. Also, it is possible for one to write types of computer high level programming languages such as JAVA, C++, BASIC, and so on. There are also other forms of classifying high level languages such as Commercial Languages, Scientific languages, Command languages, and General purpose Languages.

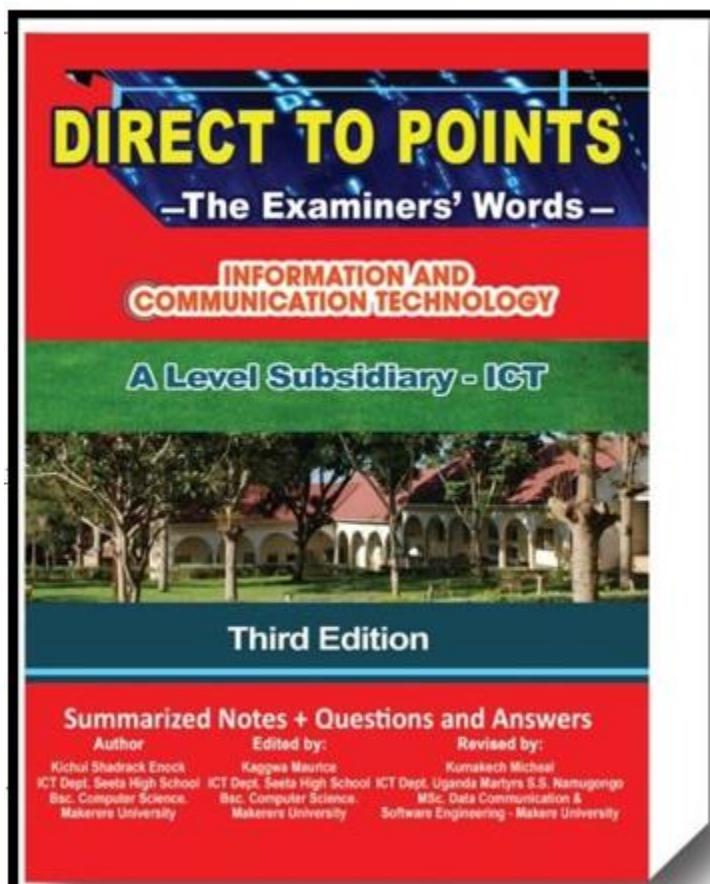


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*Direct to Points,
ICT books to be precise,
Illiteracy to fight,
With eased Comprehension.*

*You know how it works,
It hits the point right away,
Trumping the violent fear,
For great Technologists.*

*It will always be there,
To literates you one by one,
You won't be challenged,
"DIRECT TO POINTS" is power.*

*The enemy is on our way,
Thickened digital illiteracy,
The astute use DIRECT TO POINTS,
To propel POWERFUL confrontation!*

CHAPTER ONE

INTRODUCTION TO COMPUTER

Computer Studies

Is a subject which deals with the features of computers, ways and methods of using computers so as to provide a basis for understanding the impact of computers on individuals, organization and society.

Computer Literacy

- Computer Literacy is the nontechnical understanding of microcomputer, how to use simple applications such as word processor, e-mail software and of the role computers play in modern society.
- Computer Literacy includes an awareness of computers, knowledge about computers and interaction with computers.
 - Awareness means being aware of their importance, their versatility, and their potential for good and ill in our society.
 - **Knowledge**, means learning what computers are and how they work.
 - **Interaction**, means learning to use computers for some simple applications

Computer Professional

This is an expert in a profession concerning computers who has had formal education in the technical aspects of a computer. An example is a computer programmer or Systems Analyst.

Definition of Computer

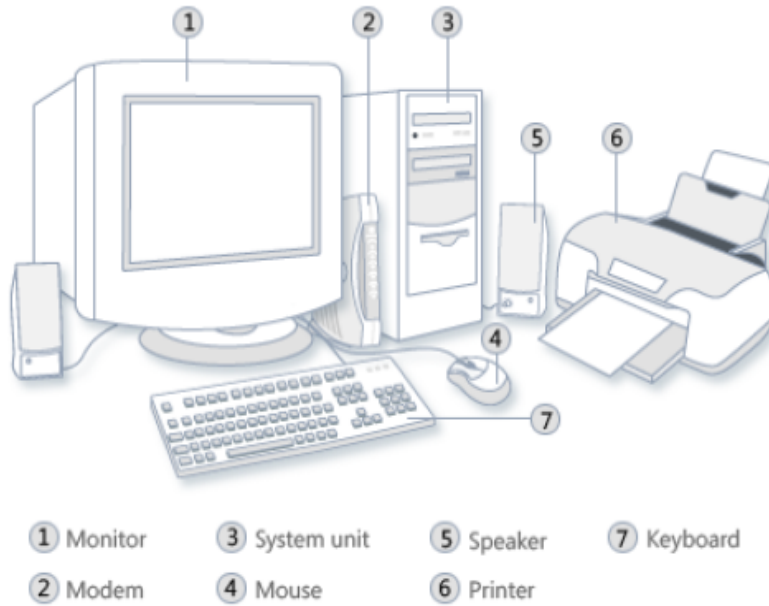
- A **computer** is an electronic machine, operating under the control of stored instructions in its own memory that can accept data, manipulate the data according to specified rules and produce meaningful information.
- A **computer** is an electronic device which is capable of receiving the inputs (data from the user), storing it for a desired period of time, manipulating it according to the set of instructions (called program) and producing the output to the user in desired form.

Information and Communications Technology (ICT)

- ICT is the combination of **telephone lines**, **computers** and **software**, which enable users to create access, store, manipulate and transmit information.
- In other words, ICT consists of IT as well as **telecommunication**, **broadcast media**, all types of audio and video processing and transmission and network based control and monitoring functions.

Parts of a Computer

A computer is really a system of many parts working together. The physical parts, which you can see and touch, are collectively called hardware. (Software, on the other hand, refers to the instructions, or programs, that tell the hardware what to do.)



The Illustration above shows physical parts of a computer.

System Unit

- The system unit is a rectangular box placed on or underneath your desk containing many electronic components that include microprocessor, memory chips, buses, and system clock that process information.
- The most important of these components is the central processing unit (CPU), or microprocessor, which acts as the "brain" of your computer.

Keyboard

A keyboard is used mainly for typing text into your computer. Like the keyboard on a typewriter, it has keys for letters and numbers, but it also has special keys:

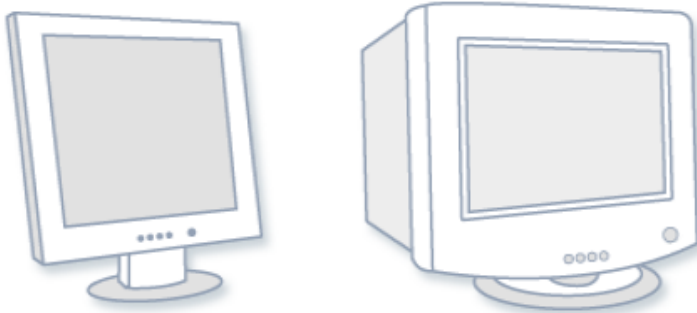
- *The function keys*, found on the top row, perform different functions depending on where they are used.
- *The numeric keypad*, located on the right side of most keyboards, allows you to enter numbers quickly.

Mouse

- A mouse is a small device used to point to and select items on your computer screen. It's small, oblong, and connected to the system unit by a long wire that resembles a tail. Some newer mice are wireless.

Monitor

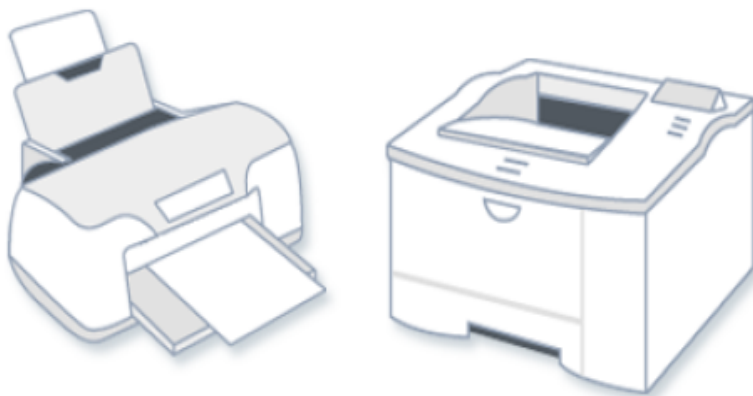
- A monitor displays information in visual form, using text, graphics, still and moving pictures. The portion of the monitor that displays the information is called the screen.
- There are two basic types of monitors: CRT (cathode ray tube) monitors and LCD (liquid crystal display) monitors.
- Both types produce sharp images, but LCD monitors have the advantage of being much thinner and lighter. CRT monitors, however, are generally more affordable.



LCD Monitor (left) and CRT Monitor (right)

Printer

- A printer transfers data or information such as e-mails, cards, invitations, announcements, photos and other materials from a computer onto paper.



Inkjet (left) and Laser printer (right)

Modem

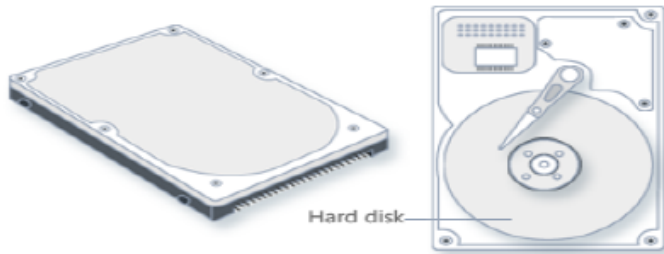
- To connect your computer to the Internet, you need a modem. A **modem** is a device that sends and receives computer information over a telephone line or high-speed cable.
- Modems are sometimes built into the system unit, but higher-speed modems are usually separate components.

Speakers

- Speakers are used to play sound. They may be built into the system unit or connected with cables. Speakers allow you to listen to music and hear sound effects from your computer.

Hard disk drive

- Hard disk drive stores information on a hard disk, a rigid platter or stack of platters with a magnetic surface.
- Hard disks hold massive amounts of information; therefore, they serve as your computer's major storage, holding almost all of your programs and files.
- The hard disk drive is normally located inside the system unit.



Hard disk drive

CD and DVD drives

- **CD drives** use lasers to read (retrieve) data from a CD. CD drives can also write (record) data onto CDs.
- If you have a recordable disk drive, you can store copy on blank CDs. You can also use a CD drive to play your computer.
- **DVD drives** can do everything that CD drives can, plus more.
- If you have a DVD drive, you can watch movies on your computer.
- Many DVD drives can record data onto blank DVDs.
- If you have a recordable CD or DVD drive, periodically (copy) your important files to CDs or DVDs. That way, if your hard disk ever fails, you won't lose your data.



Floppy disk drive

- Floppy disk drives store information on floppy disks, also known as diskettes.
- Compared to CDs and DVDs, floppy disks can store only a small amount of data.
- Floppies also retrieve information more slowly and are more prone to damage. For these reasons, floppy disk drives are less popular today, although some computers still include them.



Floppy Diskette

Characteristics of modern Computers

The features or characteristics of computers include:

- i) **Speed:-** Computers operate at a very high speed compared to humans. Tasks can be completed in fractions of a second and the speed can be measured in Gigahertz.
- ii) **Accuracy:-** Computers cannot make mistakes like humans do. Computers are capable of detecting and correcting any mistakes made by humans.
- iii) **Storage:-** Computers have the ability to store large amount of information for future reference. The data are stored in various storage media that run on the devices connected to the computer such as tapes or compact disks.
- iv) **Diligence:-** Computers have the ability of performing same task "over and over" again without getting tired or bored.
- v) **Automation:-** Computers don't need any human intervention in order to perform any programmed routines.
- vi) **Versatility:-** Computers are capable of solving a wide range of problems without the need to employ any other tool, that is, the same computer used to process business data can also be used to operate military weapons and other applications.
- vii) **Consistence:-** Given the same data, computers will always deliver the same product or information without fear of alteration.

- viii) **Artificial Intelligence:** Computers can respond to requests given and then provide solutions intelligently. For instance, a computer can be used to identify individuals using special devices like finger print scanner.

Elements of Computer Data Processing System

Computer data processing and communication system is built up by six elements:

- i) **Hardware**, consists of all machinery and equipment in a computer system e.g. printers, hard disk, keyboard, etc.
- ii) **Software**, software or programs consists of step-by-step instructions that tell the computer hardware how to perform a task.
- iii) **People**, these are the ones to analyze, develop, and improve on the computer system. They are the beneficiaries of computers and communications system.
- iv) **Procedures**, these are the descriptions of how things are done, steps for accomplishing a result.
- v) **Communication**, the electronic transfer of data from one place to another.
- vi) **Data and Information:**
 - **Data** consists of raw facts and figures that are to be processed into information.
 - **Information** is a summarized data that is useful for decision making.

Data and Information

Computers process data to create information. **Data** is a collection of raw unprocessed facts, figures, and symbols.

Information is data that is organized, meaningful, and useful.

Examples of Data and Information

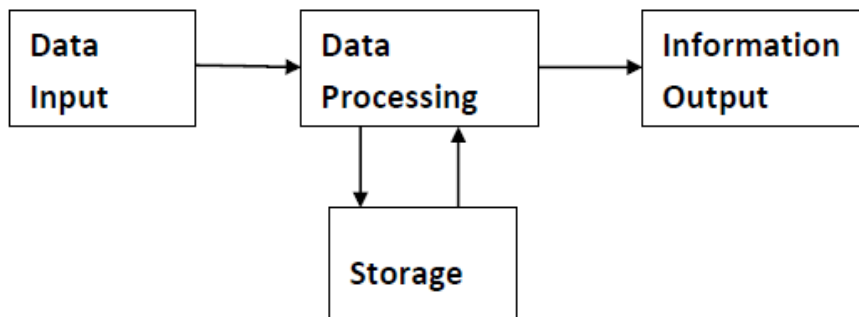
Data	Information
Letters (e.g. a, b, c)	A word e.g. Apple, a boy, etc.
Word and Symbols	A report, a letter, an essay.
Numbers	A mathematical formula
Examination scores	Comments, grades
Musical notes	A piece of music, song, etc.

Characteristics of good Information.

- i) It is relevant to its purpose
- ii) It is accurate and comprehensive
- iii) It is obtained from a reliable source.
- iv) It is communicated to the right person and in time.
- v) It is understandable by the users.

Data Processing

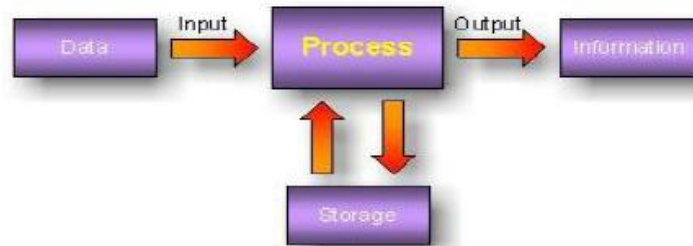
- Data processing is the manipulation of input data with an application program to obtain desired output as an audio/video, graphic, numeric, or text data file.
- It can also be described as the operations performed on a given set of data to extract the required information in an appropriate form such as diagrams, reports, or tables.



Information Processing Cycle

Information Processing Cycle is the sequence of events in processing information, which includes (1) input, (2) processing, (3) output and (4) storage

1. **Input**—entering data into the computer.
2. **Processing**—performing operations on the data.
3. **Output**—presenting the results.
4. **Storage**—saving data, programs, or output for future use.



Input Process

Input process includes the collection of raw data from the outside world so it can be put into an information system for processing. Examples:

- i) Conducting a survey of customer's opinions and then scanning the survey cards with a card reader into the computer.
- ii) Collecting workers' timecards to find how many hours each person worked that week and type the hours from the timecards into a computer.

Devices used for input process include keyboard, mouse, barcode reader and digital cameras.

Processing

- This is the time the computer executes or manipulates the input data into usable information. A central processing unit (CPU), or processor, is the key component in a digital computer capable of executing a program.
- It interprets computer program instructions and processes data. The Processor or CPU has two major components: Control Unit and Arithmetic and Logical Unit.

Output Process

- Output is the process of transmitting the processed information into user sensible form. This could be in the form of printed paper, audio, or video.
- Devices commonly used for output data include monitor screen, printer, and speakers.

Storage

- This process includes storing raw and processed data for future reference. Storage refers to various techniques and devices for storing large amounts of data.

- Modern mass storage devices include all types of disk drives and tape drives. Mass storage is distinct from memory, which refers to temporary storage areas within the computer.
- Unlike RAM memory, mass storage devices retain data even when the computer is turned off.

Computer Systems Hardware

- Hardware consists of all the machinery and equipment in a computer system such as the keyboard, the screen, the printer, and the computer itself.
- Computer hardware is categorized according to which of the five computer operations it performs:
 - i) Input Hardware
 - ii) Processing and memory Hardware
 - iii) Output Hardware
 - iv) Storage Hardware
 - v) Communications Hardware

Input Hardware:

- It consists of devices that allow people to put data into the computer in the form that the computer can use.
- Examples of input hardware include keyboard, mouse, or scanner.

Processing and Memory Hardware:

- The processor (CPU) controls and manipulates data to produce information.
- Memory is the computer's workspace, where data and programs for immediate processing are held.

Output Hardware:

- It consists of devices that translate information processed by the computer into a form that humans can understand.
- The most common output hardware includes screens, printers and speakers for sound output.

Secondary Storage Hardware:

- It consists of devices that store data and programs permanently for future reference e.g. diskettes, hard disk, magnetic tapes, and optical disks.

Communications Hardware:

It consists of all devices that allow computers to exchange data or information such as modems and communication channels.

Computer communications is of two major types:

- i) Wired connections such as telephone wire or cable.
- ii) Wireless connections such as radio waves.

A **Modem** is communications hardware required to translate a computer's digital signals into analog signals for transmission over telephone wires.

Categories of Computers by size

- Computers can be classified into four general types basing on their size (processing speed and the capacity to store data)
- These categories include:
 - i) Supercomputers
 - ii) Mainframe computers
 - iii) Minicomputers
 - iv) Microcomputers

Supercomputers

- Supercomputers are high capacity computers that cost millions of dollars, occupy special air conditioned rooms and are often used for research purposes.
- Among their uses are worldwide weather forecasting, oil exploration, aircraft design, and mathematical research.

Mainframe Computers

- Mainframe computers are fast large capacity computers, also occupying special air conditioned rooms.

- Mainframe computers are used by large organizations like banks, airlines, insurance companies, universities, to handle millions of transactions.

Mini frame computers

- Mini frame computers, also known as midrange computers are the scaled down mainframe computers.
- They are used by medium-sized companies for specific purposes such as accounting.

Microcomputers

- Microcomputers are small computers that can fit on top of the desk or one's briefcase. They are also known as personal computers.
- Microcomputers are used to run easy to use programs such as word processors or spreadsheets.
- Examples of microcomputers are desktop and laptop computers.

Microcomputer can be classified into two types:

1. Desktops
 2. Portables
- The difference is that portables can be used while travelling whereas desktops computers cannot be carried around.
 - **The different portable computers are:** -
 - 1) Laptop Computer
 - 2) Notebook Computer
 - 3) Palmtop (hand held) Computer
 - 4) Wearable computers
 - **Laptop Computer:** - this computer is similar to desktop computers but the size is smaller. They are expensive than desktops. The weight of laptop is around 3 to 5 kg.
 - **Notebook Computer:** - These computers are as powerful as desktop but size of these computers are comparatively smaller than laptop and desktop. They weigh 2 to 3 kg. They are more costly than laptop.
 - **Palmtop (Hand held) Computer:** - They are also known as Personal Digital Assistant (PDA). These computers are small in size. They can be held in hands. It is capable of doing word processing, spreadsheets and hand writing recognition, game playing, and faxing. These computers are not as powerful as desktop computers.
 - **Wearable computer:** - The size of this computer is very small so that it can be worn on the body. It has smaller processing power. It is used in the field of medicine. For example, the use of pace maker to correct the heart beats. Insulin meter to find the levels of insulin in the blood.

Classification of Computers by Process

Computers can be classified according to the type of data they can manipulate:

- i) Digital Computers
- ii) Analog Computers
- iii) Hybrid Computers

Digital Computers

- Digital computers operate on discrete data (0's and 1's). Any data/instructions to be processed by the digital computers must be converted to discrete representations.
- Digital computer's arithmetic operations and logical comparisons are based on binary digits (0's and 1's) and other characters that are numerically coded.
- Digital computers are mostly applied in business environment.

Analog Computers

- Analog computers operate on continuous data usually of physical magnitude such as lengths, voltages, pressures, etc.
- Analog computers perform arithmetic and logical comparisons by measuring of changes in physical magnitude e.g. pressure and temperature changes.
- Analog computers are applied mostly in scientific environment or engineering experiment.
- The simple examples of analog computers include slide rule, speedometer of a car, voltmeter, barometer, etc.

Hybrid Computers

- Hybrid computers combine features of digital and analog computers.
- For example in a hospital intensive care unit, analog device may measure the patient's heart functioning, temperature, and other vital signs.
- These measurements can be converted into numbers and supplied to a digital device which may send an immediate signal to nurses' station if any abnormal readings are detected.

Differences between Digital and Analog Computers

Digital Computers	Analog Computers
i) Digital computers operate on discrete data (0's and 1's)	i) Analog computers operate on continuous data.
ii) Digital computers are very accurate and consistent on the results.	ii) Analog computers are less accurate and may produce inconsistent result with same input values.
iii) Digital computers process data at a comparatively low speed than analog computers.	iii) Analog computers process data at a very high speed.
iv) Digital computers are common in business environment	iv) Analog computers are common in scientific environment.

Classifications of Computers by Purpose

- Computers can be classified as:
 - i) Special Purpose Computers.
 - ii) General Purpose Computers.

Special Purpose Computers

- These are computers designed for a particular job only to solve problems of restricted nature.
- These computers are designed to be efficient in certain class of applications.
- Examples of special purpose computers are computers designed for use in digital watches, programmed pocket calculator.

General Purpose Computers

- These are computers designed to solve a wide range of problems or tasks such as word processing, spreadsheet and playing of computer games.

Applications of Information Technology in Various Areas

Applications of IT in Schools

- Teachers use computers and other IT equipment to present teaching materials for better understanding of the learners (Computer Assisted Instruction).
- Students can use computers and appropriate software to learn at their own pace (Computer Assisted Learning).
- Teachers/Instructors can administer tests/exams online and being marked by the computers immediately (Computer Assisted Assessment).
- Used in distance learning through computer based training and web based training.
- Used in simulation of experiments for real life situations that may be costly or even dangerous.
- Used in electronic library for searching, borrowing and returning books.
- Used in Edutainment, type of educational software that combines education with entertainment.
- Used by school administration to keep records of students, teaching staffs, and non – teaching staffs.
- Used by the school bursar to monitor the payment of school fees by the students and processing the employees' salary.

- x) Used by class teachers to process the end of term report cards that show the students' conduct and academic performance.

Advantages of IT in Learning

- i) Contains multimedia effects that make learning process smooth, attractive and more interesting.
- ii) Students can receive their results immediately after doing examination
- iii) Teachers can show experiments that are difficult to perform or dangerous in nature through simulations.
- iv) Teachers can present subject matters and explain abstract concepts more clearly with multimedia.

Disadvantages of IT in learning

- i) The cost of hardware and software may be high to implement this form of learning.
- ii) It needs areas with constant electric power supply.
- iii) It requires both students and teachers to be computer literate.
- iv) Face to face interaction between teachers and students is always reduced.
- v) The concentration of students may reduce if there are also entertainment programs.

Applications of IT in Offices

- i) Creating memos, letters and reports.
- ii) Calculating payroll, prepare income statements and balance sheet.
- iii) Track inventory and generate invoice and receipt.
- iv) Present projects and ideas by means of presentation graphic software.
- v) Use facsimile electronic mail and video conferencing.
- vi) Use of telecommuting so that employer can work away from the company's standard workplace.
- vii) Creating website to provide selected information, advertise products and services and conduct E-commerce.

Applications of IT in Health Care

- i) Maintenance of patients' records in hospitals and clinic.
- ii) Monitor patients' vital signs in hospitals and at home.
- iii) Computer Assisted Medical Test.
- iv) Research and Diagnose medical conditions.
- v) Implants computerized devices that can allow patients to live longer.
- vi) Use computer controlled devices during operation that require great accuracy e.g. laser eye surgery and heart surgery.
- vii) Use of computer aided surgery for training prior to performing surgery on live human.

Functions of ICT in Business

- The main function of computers in an organization include:
 - i) **Electronic Commerce:**-Buying and selling of products or services over electronic systems such as the Internet and other computer networks. Electronic commerce include electronic funds transfer, Internet marketing, online transaction processing, electronic data interchange (EDI), and inventory management systems.
 - ii) **Preparation of payroll:-** Computers can be used to calculate gross pay, tax on the income of employees, social contributions like NSSF, and after these reductions, the net pay is determined.
 - iii) **Stock Control:-** Computer can be used to record the stock of goods purchased and sold and the prices of all items.
 - iv) **Record of Debtors:-** Computers maintain a record of debtors to ensure that debtors pay in time. Any overdue debtors can be pinpointed by the computer.
 - v) **Budgetary Control:-** Computers are used to prepare the budgets and ensure the proper implementation of these budgets. The computers can alert the management when the actual performance of the organization varies from the planned programme.
 - vi) **Production Control:-** Computers are used to control the production level. If due to any interruption, the production is discontinued for a specific period of time and rescheduling of the work becomes essential.

Functions of ICT in Education

- i) **Web based Training:-** Delivering training to individuals located anywhere in the world at anytime using computers connected to the Internet.
- ii) **Video conferencing:-** Learning can be conducted to unlimited number of individuals all over the world at the same time.

Caring of Microcomputers

Like any electronic equipment, microcomputers need to be serviced regularly to maintain their operability. Some of the measures that should be taken are:

- i) Switch on your computer hardware starting from the wall socket switch, UPS, or stabilizer, computer then printer.
- ii) Avoid making connection when the computer is on power e.g keyboard connection, mouse, printer, etc.
- iii) Avoid abrupt switching off and on of the computer system. Use the normal way of shutting, or closing down all the programs then shut down the computer from the start button.
- iv) Place the microcomputer in a dust free environment, with good ventilation. Dust covers should be used to cover the microcomputers when not in use and if you are using polythene covers do not cover the computers immediately after switching off as it will trap the heat.
- v) The microcomputers should not be exposed to a direct sunlight.
- vi) Food or drinks should not be allowed in the computer laboratory.
- vii) The computers should be regularly serviced, at least once a year or more frequently if the environment is dusty.
- viii) Do not open for the inside cleaning, this should be handled by the qualified personnel.
- ix) Ensure to use stabilizers and UPS to ensure steady power supply to the computer.

Implications of ICT in Various Sectors

In this section, we are going to investigate some of the social, legal, economic and ethical implications of using IT and Information Systems.

Social Implications

Computers in our societies have several social implications that directly affect our communities that we live in. Some of these implications include:

- i. **Easy Access and Availability to Information**
Information systems are readily accessible in school, colleges, workplaces and at home. This includes computers connected to the Internet, digital TV with its comprehensive news channels and ready availability of books, magazines and newspapers all made available by the use of Information systems.
- ii. **Better Service Delivery**
Social services are getting highly improved and faster. Computers and IT have revolutionized the banking system where customers can have access to their accounts all the times for depositing of cash, cash withdrawal, and access to their account balances.
- iii. **Employment**
ICT has generated youth employment. The increase in mobile phones has led to job creation. Telecentres are being set up in places like shops, schools and community centres. IT technicians, computer programmers, and software and hardware vendors have secured their jobs under the influence of ICT.
- iv. **Entertainment**
ICT has influenced greatly the way people spend their leisure time. Young generation spend most of their leisure time watching videos and play online games. The use of social media such as twitter, facebook, and others has become widespread. This new method of entertainment has made many youths to stay indoors rather than loitering in trading centres.

- v. **Online Communities**
Many people find themselves joining online world which is vibrant social universe where many Internet users enjoy serious and satisfying contact with online communities. These online groups are made up of those who share passions, beliefs, hobbies, or life style.
- vi. **Cultural Diversion**
ICT has exposed many youths to cultural diversity. In effect, the majority of the youths find uncomfortable with their customary values but adopting new cultures practiced elsewhere. The real danger is a possible disappearance of community cultural values in favour of the new ones.
- vii. **Moral Degradation**
ICT has created youth insensitivity on immoral actions due to frequent exposure to nudity pictures and pornographic materials online. The extent of this erosion has become even more complex to control as mobile phones are being used for the same which are easy to acquire and hide.
- viii. **Unemployment**
With advent of ICT many organizations put the vast portion of their task computerized. This practice made many workers remain redundant and consequently losing their jobs.
- ix. **Digital Divide**
 - Digital divide describes the gap between the information poor and the information rich in any society.
 - The **information rich** have easy access to computers and electronic communications. They get information and news from the Internet and buy the latest products through on-line shopping. They are able to follow computer-based learning and skills training courses at home, and look for jobs that are advertised solely on the Internet. They tend to find it easier to get well-paid jobs and will enjoy a more comfortable and secure life-style.
 - The **information poor** don't have easy access to computers and don't have the IT skills and confidence to take part in teleshopping, tele-banking, Internet chat and news groups. As corporations like the BBC seek public opinion on current matters increasingly via the Internet, the voices of the information poor may not be heard. The jobs on offer to them will be less skilled, paid less and much more insecure. The information poor will have to work longer hours just to survive and will have less leisure time. Gradually the difference in access to information may create a real social divide between the materially rich and materially poor.

Implications of ICT in Economic sectors

There is undisputable tangible growth in the economy due to the advent of modern technology. Many sectors of the economy are realizing rapid growth in their profit making once they introduce ICT. Factors that lead in economic growth as influenced by ICT include:

- i. **Efficient Management**
Use of computers in sectors of economy enhances better management on business matters. Modern technology enables regular updates to business managers facilitating quick and rightful decision making. Rightful decisions minimize errors in business and enhance profits.
- ii. **Expandability**
ICT can influence business expansion by setting up several branches without straining the managers of the business. It is possible with ICT to maintain information updates on managers about what takes place in business regardless of the size of the business or number of branches.
- iii. **Fraud control**
ICT can be used to monitor business against any attempt to fraud. Computers can be used to tress any missing detail in business which will always scare away the fraudsters from ruining the business, eventually making it to grow.

- iv. **Marketing**
ICT has improved the marketing industry. This makes it possible for the business to market its products widely to achieve the maximum sale of products. Once this is done the business will always expand and increase on the economic growth.
- v. **Better services**
Use of computers makes a business improve on its service delivery. Customer demands are met in time and complete. Good service delivery sends the reputation of the business at the peak which in return, attracts more clients and maintains the current ones.
- vi. **Reduced Labor Cost**
With the advent of computers cost of employing hundreds of employees can be saved. The amount spared can be used for rapid expansion of the business which can affect the economic growth.

Implications of ICT in Politics

The use of ICT greatly has affected politics around the world. Several political decisions are influenced by the ICT existence. The following describe the impacts of ICT in politics:

- i. **Democratization**
Many people's voices can be heard using ICT driven facilities like talk shows prepared by broadcasting corporate like BBC radio, local TV stations and radio stations. Good number of people can be able to contribute on common matters as they arise in their country or continent.
- ii. **Strengthening political parties**
ICT is a major factor in building the strength of a political party. Communication flow can be enhanced to party members encouraging fundraising practices. Extra party members can be sought using social media and campaigning.
- iii. **Revolutions**
ICT has been a major cause of political revolutions. The discontented citizens could use ICT social media such as facebook and twitter to mobilize people to demonstrate against dictatorial government. For instance Tunisia and Egypt managed to change their governments by the use of ICT.
- iv. **Political Enlightenment**
ICT has enhanced the awareness of the governed citizens about their rights and what they should expect from their leaders. On this account, accountability among the leaders to their citizens has been raised fearing of possible change in their leadership.
- v. **Electronic Voting (E-voting)**
ICT has enabled E-voting of which voters' turn up has been raised. This method has also reduced the strain of counting and possible manipulation of polling results. It will as well increase the trust in electoral commissions and maintain peace in the country that uses this system.

Implications of ICT in Environment and Green Computing

ICT impacts on our environment both positively and negatively. The positive impacts of ICT on our environment include:

- i. **Improved Disaster warning and relief**
ICT related tools have managed to prevent adverse effects of natural disasters like earthquakes, storms, and heavy rains by predicting exact time and locations where the disaster is likely to strike. Human lives and property is highly saved because of proper and timely delivery of information.
- ii. **Improved monitoring of air and water pollution**
ICT takes a large part in controlling the quality of water and fresh air especially in places where they setup industries that pollute both water and air. ICT related sensors (hardware and software) are to be used to monitor and regulate the level of pollution.

iii. **Improved biodiversity preservation**

ICT tools and facilities have enabled climate change experts to effectively acquire information on endangered species. This information has been vital for taking up prompt measures to prevent the rapid extinction in some of the species.

iv. **Improved agriculture**

By the use of wireless sensors ICT enables farmers to have real-time measurements of soil moisture, crop health, and animal movement. This data will help inform practices for sustainable agriculture and help farmers to more accurately and effectively control activities such as irrigation, planting, stock movement, and pesticide application.

Green Computing

- Is the practice of manufacturing, using, and disposing of computers, and associated subsystems—such as monitors, printers, storage devices efficiently and effectively with minimal or no impact on the environment.
- The goals of green computing are to reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and promote the recyclability or biodegradability of defunct products and factory waste.
- Many corporate IT departments have Green Computing initiatives to reduce the environmental impacts of their IT operations.

Uses of ICT in Security

ICT is of crucial importance in security matters today. Any security organ will find ICT necessary for effective defense. ICT can be used in security as described below:

i. **Car Tracking Systems**

Vehicle tracking systems are used in consumer vehicles as theft prevention. Police can simply follow the signal emitted by the tracking system and locate the stolen vehicle. Vehicle tracking systems control vehicle remotely, including block doors or engine in case of emergency. The loss-risk of the vehicle drops significantly.

ii. **Surveillance**

Is the monitoring of the behavior, activities, or other changing information, of people for the purpose of managing or protecting by the use of cameras that collect this information to computer. Surveillance is very useful to maintain social control, recognize and monitor threats, and prevent or investigate criminal activity.

iii. **Criminal Investigation**

The Police use ICT to store large amounts of data about people which includes their name and fingerprints. Police can then be able to compare the finger prints collected from the crime scene and those stored in the database to identify possible criminals.

iv. **Traffic Control Systems**

ICT can be used with speed cameras to catch those breaking the traffic laws. The computers can now set up the cameras to take photos of the number plate and driver. Both a photo of the plate number and the person driving it are to be used as evidence for a criminal conviction.

v. **Security Scan System**

ICT systems are used for crime prevention and investigation by full body scanner which allows people to see if there is anything potentially dangerous under someone's clothes. Airports especially X-ray people's bags to allow clearer pictures of the contents of bags and so protecting the passengers from any potential threat.

ICT Security Setbacks

IT is also used by criminals as well as the police. Criminals also use computers to commit cyber crimes (which are not always based on the internet). Criminals can take advantage of the ICT as follows:

- i. **Hacking.**
One thing that criminals can do is hack into someone else's computer and steals the contents of the hard drive which could include personal information.
- ii. **Online Robbing**
Another thing that the criminals can attempt to do is defraud people by tricking them into giving up bank details to them via e-mails and viruses. With these stolen details, criminals can now rob the person's bank account by transferring money to one of their accounts.
- iii. **Impersonation**
It is possible for criminals to open e-mail and facebook accounts using other people's identity. They will therefore trick their victims asking for help such as money. Some of the victims may comply with the request thinking they are helping the person they know.
- iv. **Financial Abuses**
Criminals can use ICT to edit and print counterfeit money using coloured printers or use fictional credit cards to obtain goods or services from the Internet.
- v. **Forgery**
ICT facilities can be used by criminals to duplicate certificates to unqualified individuals or forging travel documents. By the time these criminal actions are detected significant damage could have been done.

Health Hazards caused by using Computers

If we use a computer for many hours we stand a risk to be affected by several body weaknesses which may include:

- i. **Eye Strain:-** This is likely to be caused by looking at your monitor for a long period of time. The muscles that focus your eyes do not move, and so get tired and painful.
- ii. **Back and Neck ache:-** Many people complain of back and neck pain after using a computer for a long period of time. This is usually caused by bad sitting posture.
- iii. **Repetitive Strain Injury (RSI):-** Typing and using a mouse for a long time are common causes of repetitive strain injury in the wrists and hands.
- iv. **Obesity:-** This can be possible to people who use computers for long period of time with reduced movement or exercises.
- v. **Headache:-** Using a computer for a long period of time until you are too fatigued can result into headache.

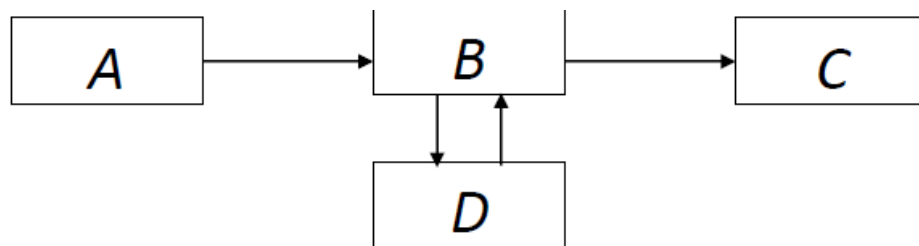
Controlling Computer related health Hazards

To minimize computer related health problems users of computers should ensure the following:

- i. Use an anti-glare filter in front of the monitor to cut down on screen reflections that can tire the eyes.
- ii. Look away from the monitor at regular intervals and refocus on distant or close objects to exercise the muscles in the eye.
- iii. Use an adjustable, ergonomic chair, and take the time to set it up properly.
- iv. Take regular breaks – get up, walk around, stretch your muscles.
- v. Use a wrist rest to support the wrists while typing and when using the mouse.

Exercise 1-1

1. The computer system is made up of the following key elements
 - A. Hardware and documents
 - B. Software and other application programs
 - C. Hardware and Software
 - D. Data and Instruction.
2. Computer literate involves
 - A. Learning the basic elements on how to use a computer and accomplish your goal
 - B. Becoming a computer professional
 - C. Knowing how to play computer games
 - D. All of the above
3. He is a "computer wizard" mean:
 - A. He can perform magic by using computers
 - B. He is a computer expert
 - C. He loves computers very much
 - D. All of the above answers are correct.
4. The word SOFTWARE means:
 - A. Step-by-step instruction telling the computer hardware part on how to do the work.
 - B. Electric current sufficient to run the machinery parts of a computer.
 - C. Documents and data that are permanently stored on computer hard drive
 - D. Softer parts of the computer hardware.
5. Computers can be used to perform all of the following, except
 - A. Thinking
 - B. Budgeting
 - C. Storing
 - D. Processing of data.
6. Which of the following depicts the order of most powerful computers from the bottom to the top?
 - A. Supercomputers, mainframes, minicomputers, microcomputers
 - B. Mainframes, supercomputers, minicomputers, microcomputers
 - C. Microcomputers, minicomputers, mainframes, supercomputers
 - D. Microcomputers, mainframes, minicomputers, supercomputers
7. Charles Babbage worked on the machine that was called:
 - A. Pascaline
 - B. Logarithm
 - C. Analytical Engine
 - D. Slide rule.
8. The second generation of computer was first well known because of its use of:
 - A. Vacuum tube
 - B. Semiconductor memory
 - C. Transistors
 - D. Integrated circuits
9. The reason why 1st Generation of computers were considered inefficient is because:
 - A. They had limited main memory for processing data.
 - B. They used machine and assembly language
 - C. The consumed a great deal of power.
 - D. All of the above are correct.
10. The following is a classification of computers by process:
 - A. Supercomputers and mainframe computers
 - B. Digital computer and mainframes
 - C. Analog and microcomputers
 - D. Analog and digital computers
11. The ability of computer to perform variety of tasks is referred to as:
 - A. Diligence
 - B. Consistence
 - C. Automatic
 - D. Versatility
12. Which of the following computers are properly suited?
 - A. Analog for business and digital for science
 - B. Analog for counting and digital for fighting
 - C. Analog for counting and digital for measuring
 - D. Analog for science and digital for business
13. "Data" means:
 - A. Processed information
 - B. Raw facts
 - C. Meaningful information
 - D. All of the above are correct



14. From the above diagram:
 - A. A=Data processing, B=Data, C=Information, D=Storage
 - B. A=Data, B=Storage, C=Information, D=Data processing
 - C. A=Data, B=Data processing, C=Information, D=Storage
 - D. A=Storage, B=Data processing, C=Information, D=Data
15. Which device that operates by measuring physical change in magnitude?
 - A. Analogs
 - B. Mainframes
 - C. Digitals
 - D. Hybrids
16. Which of the earliest calculating devices that reflected today's computers?
 - A. Logarithms
 - B. Stepped Reckoner
 - C. Looms
 - D. Analytical Engines
17. "WWW" stands for:
 - A. World Web Wide
 - B. Wide World Web
 - C. Web Wide World
 - D. World Wide Web
18. The term "Computerization" means:
 - A. Purchasing new computers
 - B. Connecting computer to the internet
 - C. Computer servicing
 - D. Making tasks to be done by computers
19. Which of the following category of computers are utilized most in weather forecasting and oil exploration?
 - A. Supercomputers
 - B. Minicomputers
 - C. Mainframes
 - D. Microcomputers
20. "Pascaline" was invented by:
 - A. Leibniz
 - B. Babbage
 - C. Blaise
 - D. Napier
21. Which of the following is the oldest calculating device?
 - A. Logarithm
 - B. Abacus
 - C. Pascaline
 - D. ENIAC
22. Which of the following is the best definition of a computer?
 - A. A device that accept data/instruction, temporarily store and process the input data to produce the meaningful information.
 - B. An electronic device that automatically, performs calculations as per given instruction by the computer user.
 - C. A device that carryout calculations at an amazing speed with maximum accuracy.
 - D. Any device that is capable of simplifying human tasks.
23. The use of simple programming languages was introduce during:
 - A. 1st Generation of computers
 - B. 2nd Generation of computers
 - C. 3rd Generation of computers
 - D. 4th Generation of computers
24. The "Computer generations"
 - A. Describes people who lived during the time of developing computer technology
 - B. Describes the nature and behavior found in computers of different manufacturers
 - C. Describes the development stages that were noticed from time to time, each showing an improved characteristic from the former.
 - D. All of the above answers are correct.
25. Which of the following shows the correct order?
 - A. Vacuum tubes, Transistors, IC, LSI
 - B. Transistors, IC, Vacuum tubes, LSI
 - C. LSI, IC, Transistors, Vacuum tubes

- D. IC, Transistors, Vacuum tubes, LSI
26. The transformation of raw facts and figures into meaningful information is called:
 - A. Data processing
 - B. Data
 - C. Information technology
 - D. Data collection
 27. Which of the following computer uses binary codes (1's and 0's) to represent information?
 - A. Digital computers
 - B. Analog computers
 - C. Supercomputers
 - D. All computer
 28. The development of the Microprocessors is a typical characteristic of:
 - A. 1st Generation
 - B. 2nd Generation
 - C. 3rd Generation
 - D. 4th Generation
 29. The problems with first generation of computers is that:
 - A. They used a lot of power and generated a lot of heat
 - B. They had limited internal memory
 - C. They had very large physical devices
 - D. All of the above are correct.
 30. The Artificial Intelligence and Expert Systems was realized in the following generation of computers.
 - A. 1st Generation
 - B. 2nd Generation
 - C. 3rd Generation
 - D. 4th Generation
 31. Which of the following type of computer devices are used for information output?
 - A. Mouse, printer and Monitor
 - B. Printer, diskette, and keyboard
 - C. Printer, Monitor and speakers
 - D. Speakers, Printers, and Keyboards
 32. Which of the following devices was invented by Leibnitz?
 - A. Stepped Reckoner
 - B. Logarithms
 - C. Analytical Engine
 - D. Slide rule
 33. Which of the following technologies is part of the mechanical era inventions?
 - A. The use of Internet
 - B. The use gears and wheels in calculating devices
 - C. The use of mobile phones as the means of calculations
 - D. The use of operating systems
 34. What were computers of the first generation characterized by?
 - A. Heavy weight and high speed
 - B. Large spacing and high speed
 - C. Heavy weight and limited memory
 - D. High storage capacity and high speed
 35. Which of the following hardware devices can retain information for future reference?
 - A. Hard disk and printer
 - B. Hard disk and floppy diskette
 - C. Main memory and Hard disk
 - D. Printers and keyboards
 36. Which of the following computers are categorized as notebook computers?
 - A. Personal Digital Assistant and Laptop computers
 - B. Desktop Computers and Laptop computers
 - C. Desktop computers and miniframe computers
 - D. Personal Digital Assistant and Desktop computers
 37. Which of the following computers were common in the first generation?
 - A. UNIVAC-1 and ENIAC
 - B. Desktop Computers
 - C. Analytical Engine and Pascaline
 - D. Apple and Xerox computers
 38. Which of the following are the earliest computer high level programming languages?
 - A. C++ and JAVA
 - B. FORTRAN and Pascal
 - C. COBOL and FORTRAN
 - D. JAVA and PYTHON
 39. Which of the following technologies is the latest?
 - A. Vacuum tube and Large Scale Integration
 - B. Large Scale Integration and Integrated Circuits

- C. Vacuum tubes and Integrated Circuits
- D. Vacuum tubes and Transistors
- 40. Buying and selling of products or services over electronic systems such as the Internet is referred to as?
 - A. Electronic transfer
 - B. Electronic Commerce
 - C. Internet Commerce
 - D. Electronic

Exercise 1-2

1. Briefly describe six elements of computer data processing system

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____
- vi. _____

2. Briefly describe four types of computers by size

- i. _____
- ii. _____
- iii. _____
- iv. _____

3. Write down the following abbreviated computer related terms in full:

- i. **WYSIWYG** _____
- ii. **BASIC** _____
- iii. **COBOL** _____
- iv. **FORTRAN** _____
- v. **GIGO** _____
- vi. **PC** _____

4. Briefly describe any five characteristics of modern computers

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

5. Briefly describe four functions of computers in business sectors

- i. _____
- ii. _____
- iii. _____
- iv. _____

6. Describe any five categories of computer system hardware. Include examples.

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

7. Define **Information processing life cycle**. Illustrate your definition using a simple diagram.

8. Describe the four stages that take place during information processing life cycle.

- i. _____
- ii. _____
- iii. _____
- iv. _____

9. Define the following:

a. **Digital computers**

b. **Analog computers**

c. **Hybrid computers**

d. **Special purpose computers**

e. **General purpose computers**

10. Define the following

i. **Digital divide**

ii. **Green Computing**

11. Suggest any four methods that can be used to narrow the digital divide gap in the society

- i. _____
- ii. _____
- iii. _____
- iv. _____

12. State any four goals of **green computing**?

- i. _____
- ii. _____
- iii. _____
- iv. _____

13. Write down any five ways of taking care of microcomputers.

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

14. Briefly explain any five implications of ICT in politics today.

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

15. Briefly describe any five effects of ICT in economic sectors

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

16. Identify and describe the any five negative impact of ICT in our social environment.

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

17. What is cyber bullying?

18. State any three examples of Cyber Bullying

- i. _____
- ii. _____
- iii. _____

19. Suggest any four ways that can be used to fight against cyber bullying.

- i. _____
- ii. _____
- iii. _____
- iv. _____

20. If a computer is to be used in various fields, what do you think is the major use of computers in the following fields?

- i. **Health**

- ii. **Security**

- iii. **Education**

- iv. **Agriculture**

- v. **Transportation**

- vi. **Business**

CHAPTER TWO

COMPUTER MANAGEMENT

Booting

- **Booting** is the initial set of operations that a computer system performs when electrical power to the CPU is switched on.
- The process begins when a computer is turned on for the first time or is re-energized after being turned off, and ends when the computer is ready to perform its normal operations.

Types of Booting

There are two major types of booting, which are:

- i) Cold Booting
- ii) Warm Booting

Cold boot (or hard boot)

- Is a term used to describe the process of turning on the computer after it has been powered off.
- For example, when you first turn your computer on after being off for the night that is referred to as cold booting the computer.

Warm boot (or soft boot)

- Is one method of resetting a computer system that is already powered on, commonly used to recover from errors that cannot be recovered, or when a computer locks.
- A warm boot can be accomplished by pressing the CTRL - ALT - DEL keys simultaneously, or by selecting the restart command from an operating system menu. Warm boots run faster than turning a computer off and on again.
- The following situations can necessitate a user to **warm boot** his/her computer:
 - i) After the computer has frozen or hanged out.
 - ii) After installing a computer program.
 - iii) After fixing a new hardware device.

Booting Process

- The bootup process is a list of detailed procedures that the system undergoes to perform all system checks and load all necessary files to bring the computer to an operable state.
- The steps in booting process that take place when you press the power button of your computer include:
 - i. The computer sends a signal to motherboard which in turn starts the power supply.
 - ii. After supplying the correct amount of power to each device, it sends a signal called "Power OK" to BIOS which resides on motherboard.
 - iii. Once the BIOS receive the "Power OK" signal, it starts the booting process by first initializing a process called POST (Power On Self-Test).
 - iv. POST first check that every device has right amount of power and then it check whether the memory is not corrupted.
 - v. Then POST initializes each device and finally it gives control to BIOS for further booting.
 - vi. BIOS finds 512bytes of image called Master Boot Record (MBR) or Boot sector from the floppy disk or hard disk which is used for booting.
 - vii. Once BIOS finds the boot sector it loads the image in memory and executes it.
 - viii. If a valid boot sector is not found, BIOS check for next drive in boot sequence until it finds valid boot sector.
 - ix. If BIOS fails to get valid boot sector, generally it stops the execution and gives an error message "Disk boot failure".

NOTE

It is boot sector's responsibility to load the operating system in memory and execute it.

Computer Files

- A **computer file** is a specific piece of data that is held on a computer system. A computer file is made up of a name that creates the **file's identity** and an **extension** that tells the operating system and associated programs what type of file it is.
- A **compute file** is a collection of data or information that has a name, called the *filename*. Almost all information stored in a computer must be in a file.

Types of Computer Files

Computer files are of several types. The most common types of computer files include:

- System Files**:- These are files used to run the computer system hardware and application programs. E.g. Windows operating systems files and device drivers.
- Program File**:- This is an organized list of instructions that, when executed, causes the computer to behave in a predetermined manner. For example a computer game. Without programs, computers are useless.
- Document File**:- Is a user file created by the use of application program such as word document or spreadsheet document
- Data file**:- Is a computer file which stores data to be used by a computer application or system.
- Multimedia file**:- File that combines multiple media such as video, audio, graphics, and text data.
- Directory (Folder) File**:- Is a virtual container within a graphical user interface, in which groups of computer files and other sub-directories can be kept and organized.

File Extension

- A file name extension is a set of characters added to the end of a file name that determine which program should open it.
- Examples of filename extensions are .png , .jpeg , .exe , .dmg and .txt .

Common File Extensions

- BAT** - MS-DOS batch file.
- BIN** - Binary File.
- BMP** - Bitmap format.
- CGI** - Common Gateway Interface. Web based programs and scripts.
- COM** - Command File.
- CSS** - Cascading Style Sheet. Creates a common style reference for a set of web pages.
- DOC** - Document format for Word Perfect and Microsoft Word.
- EXE** - DOS based executable file which is also known as a program.
- GIF** - Graphics Interchange Format that supports animation. Created by CompuServe and used primarily for web use.
- HTM** - Hyper Text Markup. This markup language is used for web design.
- HTML** - Hyper Text Markup Language. This markup language is used for web design.
- JPEG** – Joint Picture Expert Group:- Compression scheme supported by most graphics programs and used predominantly for web use.
- MDB** - Microsoft Access Data Base File.
- MID** - MIDI music file.
- MP3** - MPEG Audio Layer 3.
- MPEG** – Moving Pictures Expert Group:- Animation file format.
- PDF** - Portable Document File by Adobe. Viewable in a web browser or with Adobe Acrobat.
- PDF** - Printer Description File. Provides printer support for certain applications.
- PPT** - Microsoft PowerPoint presentation (default extension).
- RTF** - Rich Text Format.
- SGML** - Standard Generalized Markup Language.
- TXT** - Text Format.

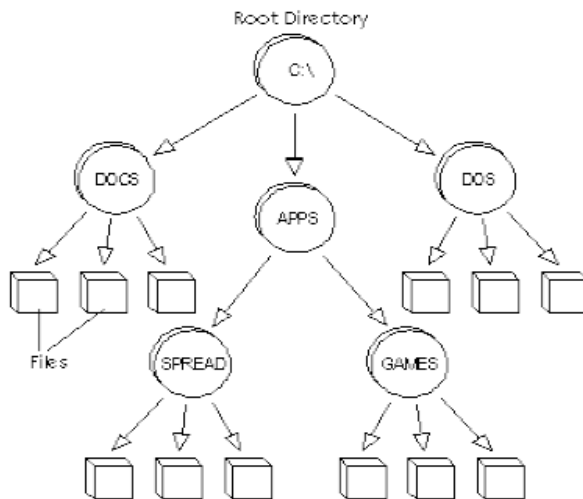
- xxiii. **XLS** - Microsoft Excel Spreadsheet.
- xxiv. **XML** - Extensible markup language.
- xxv. **ZIP** - Compressed Zip archive.

File Management

- File management involves the skillful use of file operational tools enabling ones to create, edit, format, save, view, print, rename, copy, delete, rename, recover, and monitor your computer files.
- Special utility programs are used to perform several file management operations which may include monitoring free space on your drives, create a virtual drive, or compare files and directories.

Folders and Subfolders

- A **folder** is an organizational unit, or container, used to organize sub-folders and files into a hierarchical structure.
- A **sub-folder** is a folder created within a folder. It can contain other sub-folders and files. The main folder that that all other folders and sub-folders are created is referred to as **Root Folder** or **Root-Directory**.



File Naming Convention

The name of each file must be unique within the directory where it is stored. This insures that the file also has a unique path name in the file system. File-naming guidelines are:

- A file name can be up to 255 characters long and can contain letters, numbers, and underscores.
- The operating system is case-sensitive which means it distinguishes between uppercase and lowercase letters in file names. Therefore, FILEA, FiLea, and filea are three distinct file names, even if they reside in the same directory.
- File and folder names should be as descriptive as possible.
- Certain characters have special meaning to the operating system, and should be avoided when naming files. These characters include the following:
 / \ " ' * ; - ? [] () ~ ! \$ { } < > # @ & |

File Backup

- File Backup** is the activity of copying files or databases so that they will be preserved in case of equipment failure or other catastrophe.
- Backup is usually a routine part of the operation of large businesses with mainframes as well as the administrators of smaller business computers. The retrieval of files you backed up is called *restoring* them.
- File backup can be of two major methods:

- i. Offline Backup (Local Backup)
 - ii. Online Backup (Internet Backup)
- **Local Backup** involves backing up important files to external devices like diskettes, external hard disks, Compact Disks and Zip drives. This method is faster and easier to restore your files where necessary. However, some external devices may not be reliable and some may be too costly especially external hard disks.
 - **Internet Backup** involves sending your files to another site on the internet computer for safekeeping. In case your hard disk crashes, you'll be able to download them from the safekeeping site. This method is only possible if your computer is connected to the internet.

How to Manage and Organize Computer Files

Computer files can be at risk if they lack proper management skills. A computer user therefore should be exposed to these skills to avoid possible loss, misplacement, or unable to retrieve very important files. To manage your files properly the following should be considered:

- i. **Use of Folders:-** Create a folder which can be used to store all your personal or departmental files. Use sub-folders to hold related files. The folder and sub-folders should have descriptive names for easy identification.
- ii. **Creating Backups:-** For many reasons your hard disk may suddenly fail. Users should therefore create backups on different storage devices to help restore files in case of disaster or failure. You should as well use the online backups to supplement on your local storage devices.
- iii. **Develop File naming Scheme:-** While working on files and folders, it is important that you develop a naming scheme for the kinds of files you create most often and then stick to it. For example, use the name of your department, the month the file was created, and the content of your file to suggest the name to be given to that file.
- iv. **Creating Passwords:-** You should have a common password known to you or other departmental members to be used to each file. This will block un authorized users from accessing your files even if the copy your files for any purpose. You should also consider changing passwords from time to time.
- v. **Create shortcuts to your files:-** Create shortcut links to files that you edit them frequently. You place the shortcut icon on your desk top to help you open your file easily and faster. To create a shortcut, right-click the file and then click **Create Shortcut**.
- vi. **Use Copy and Paste:-** Use this feature to save your valuable time if the content you are editing already exists in another document.
- vii. **Separate your files:-** Avoid keeping unrelated files together. Video, images, and program files should be kept separately from document files for easy management.
- viii. **Compress your files:-** Large files should be compressed to create more storage space on your hard disk or for easy transmission. A compressed file is easier to attach and e-mail than uncompressed files.
- ix. **Use a portable computer:-** If you use a portable computer such as laptop and notebook computers with a battery to retain power you are assured to keep on working on your unfinished work while at home, traveling, or any other location away from your place of work.

How to maintain good computer performance

In most cases users experience the slowdown of their computers after using them for some period of time. Users can ensure to do the following activities regularly to prevent computers from slowing down:

- i) **Cleanup unwanted files:** Use *disk clean up utilities* to wipe out temporary files usually created automatically by the operating system as you use your computer. By freeing your hard disk from several unwanted files the performance of your computer will increase.

- ii) **Scan your disk for errors:-** Use *disk scan utilities* to scan for errors on the disk and recover the lost data. This will enable the computer to mark bad sectors on the disk to avoid any attempt by the computer to write data on those areas.
- iii) **De-fragment your disk:-** When portions of files keep on scattered (fragmented) around the disk cause the computer to slow down. Use *disk defragmenter utilities* to reorganize (defragment) all small scattered portions of the files together to enhance the speed of retrieving your files.
- iv) **Compress your files:-** If a computer has large files the storage space will be used up preventing computer from operating properly. Use any of the *data compression utilities* to reduce the size of your files to free the hard disk space.
Compressed files are usually called **zipped files** because they usually have a .ZIP extension.

Compressing files offers two important advantages:

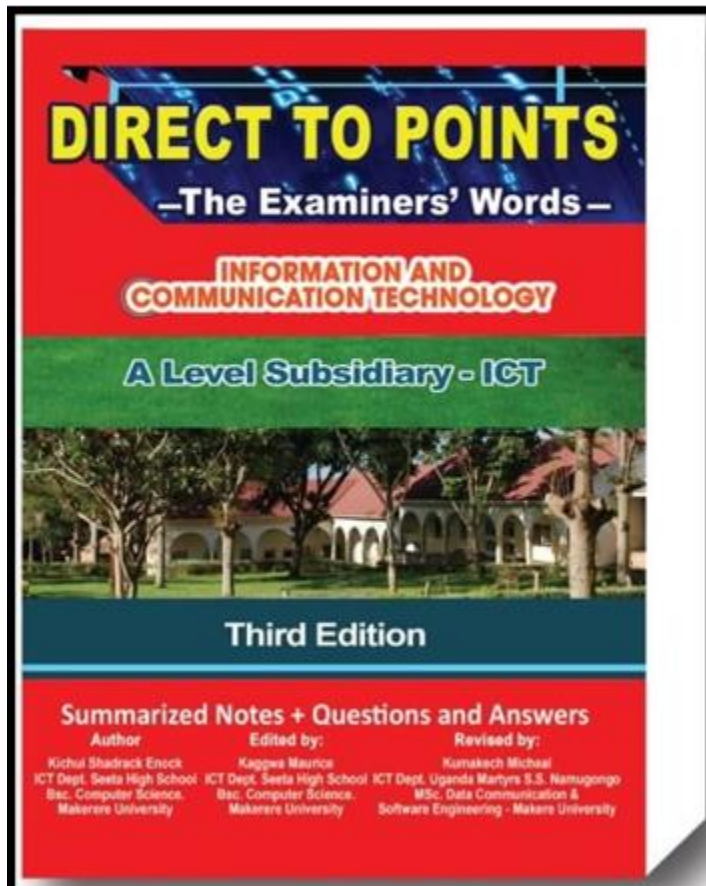
- **Storage space:-** Smaller files mean less space for storage of extra files saving cost of extra storage device.
- **Transmission time:-** Uploading and downloading of files will take much shorter time compared with uncompressed files.

Computer Specifications

Before one purchases a computer it is important to look at some features available in that particular computer which must include:

- i) **Operating System:**
 - The version of operating system installed is important depending on the kind of hardware and application software the user is expecting to use.
 - Some software and hardware's specifications may not run on some operating system platform.
 - The latest Operating systems specifications include Windows 10 or higher or Mac OS 10.11 El Capitan.
- ii) **Memory Size:**
 - The size of main memory (RAM) determines what size of program can be loaded in memory during processing time.
 - Big programs demand more memory size to run effectively. Latest computers have a minimum of 8 GB of RAM size.
- iii) **Processor Speed:**
 - Processor speed describes the amount of information the computer can work on per given time. Eg. 2.93GHz processor speed, etc.
 - The speed of a processor is measured in megahertz (MHz), Gigahertz (GHz), etc.
 - There are a range of ways used to describe the processor power and the latest processors have a minimum of Intel Core i5 or equivalent.
- iv) **Hard Drive:**
 - All our programs, data files and the operating systems reside on the hard disk. The size of the hard disk is important depending on the extent of information to be stored there.
 - Video and graphic files such as computer games occupy a lot of space. Most PCs have up to 320 GB or larger.
- v) **DVD Drive:**
 - A computer with a DVD drive can enable the reading or writing on to CDs and DVDs storage media.
 - They come in range of capacities and the latest specifications provide DVD +/- RW Dual Layer Burner or Mac Super Drive.
- vi) **Network Adapter:**
 - In order for the computer to support internet it must have a network interface card.
 - The network card can be Ethernet or Wireless and they are available in a range of capacities that determine their speed of transmitting data.

The Topic Continues



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