INFORMATION COMMUNICATION TECHNOLOGY (ICT) [Concepts and Application]

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INFORMATION COMMUNICATION TECHNOLOGY (ICT)
[Concepts and Application]

Self-Directed & Collaborative Learning Approach
Volume I

By

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Foreword

Information Technology Communication is defined as the convergence of audio-visual, telephone and computer networks through a link system. It is a combination of all these elements, capped by a vision on how technology can help an organization to reach its goals.

The book provides basic theoretical and practical information on some aspects of Information Communication Technology, data processing and windows operating system, and their applications. This book has been written in a simple language that will be easily comprehended by readers and users of the book. Students and teachers of computer science at Universities, Polytechnics, Colleges of Education and Allied Institution will find the book useful and enlightening.

The book is widespread, while the foundation is based on Information Technology. One important strength of the book is very wide applications of principles of data processing techniques. The author is congratulated for such a thorough work.

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Preface

The objective of this book is to introduce students of Accountancy & Finance, Business Administration, Marketing, Banking & Finance, and Office Technology Management of Nigeria Polytechnics and Colleges of Technology to modern Information Communication Technology (ICT), Data Processing and Its Applications.

This book provides basic theoretical and practical information on some aspects of Information Communication Technology (ICT), Data Processing and Its Application for the departments mentioned.

The contents of this book are not in contradiction to Curriculum and Course Specification produced by the National Board for Technical Education (NBTE) UNESCO – Nigeria Project.

The book will be very useful for the readers of different categories undergraduate students of University, Polytechnics, Colleges of Education and Allied institutions in areas of computer science, management science and other related disciplines.

The book can also be used as course material for introduction to computer course in other departments. There is no doubt that this book will be very useful to all categories of readers. In case of any positive contrary or suggestion for improvement in the next edition of this book you may call 08094204341 or e-mail engryekini@yahoo.com. You can visit www.engryekini.com for more detail.

Yekini N.A.   2014

Instruction for the Users of This Book

The users refer to in this page are Students, Instructors and Lecturers.

The Curriculum and Course Specifications varies from one Department to another, as a result users are advised to use Curriculum and Course Specifications for their course as reference guide to usage of this book as an instructional material for Information Communication Technology (ICT), Data Processing and Its Application in school of management and business studies of Nigeria polytechnics or colleges of technology.

This book is specifically written and covered the syllabus for Information Communication Technology (ICT), Data Processing and Its Application in school of management and business studies, Nigeria polytechnics and colleges of technology, but it is usage is not limited to that, it can also be used as instructional material for introduction to computer, computer application in other departments.

However the users are advised to go through the syllabus for the courses he or she is taking before start using this book.

Thank you

Acknowledgement

First of all I am very grateful to Allah (SWT) for his mercy and wisdom bestow on me to write this book. This book evolved from my experiences in teaching and research in Computer Science and Technology and also as ICT service lecturers to some departments in the school of management and business studies of Yaba College of Technology.

There are some individuals that contributed to the success of the research that gave birth to this book. I acknowledged all the staff of Department of Computer Technology; they are all wonderful to me during the process of compiling this book.

I acknowledge the contribution of the management of Yaba College of Technology for providing enabling environment for research and publication in the college. I also acknowledged members' of staff of Yeknua ICT & Educational Research-Publication Center.

I also acknowledged the contribution of my past students from the department of accountancy, business administration, and office technology and computer department of Yaba College of technology.

Finally, I acknowledged the contribution of my wife and children. Their prayer and endurance has made this project a reality.

Thank you.

THIS BOOK BELONGS TO

NAME: _____

SCHOOL: _____

DEPARTMENT: _____

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DATE: _____

Chapter One
Concept of Information Communication Technology

1.1 Information Communication Technology Versus Information System

Information and Communications Technology or (ICT), is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information. *The term ICT is now also used to refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system.* There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the audio-visual, building management and telephone network with the computer network system using a single unified system of cabling, signal distribution and management.

The term *Infocommunications* is used in some cases as a shorter form of information and communication(s) technology. In fact Infocommunications is the expansion of telecommunications with information processing and content handling functions on a common digital technology base.

Information technology (IT) is the application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data, often in the context of a business or other enterprise. The term is commonly used as a synonym for computers and computer networks, but it also encompasses other information distribution technologies such as television and telephones. Several industries are associated with information technology, such as computer hardware, software, electronics, semiconductors, internet, telecom equipment, e-commerce and computer services.

In a business context, the Information Technology Association of America has defined information technology as "the study, design, development, application, implementation, support or management of computer-based information systems". The responsibilities of those working in the field include network administration, software development and installation, and the planning and management of an organization's technology life cycle, by which hardware and software is maintained, upgraded, and replaced.

Yekini and Lawal (2012) Sees ICT as: a powerful collection of elements which include computer hardware, software, telecommunication networks, workstations, robotics and smart chips, which is also at the root of information systems

1.2   Information System (IS)

An information system (IS) is the study of complementary networks of hardware and software that people and organizations use to collect, filter, process, create, and distribute data. The study bridges business and computer science using the theoretical foundations of information and computation to study various business models and related algorithmic processes within a computer science discipline. **Computer Information System(s) (CIS)** is a field studying computers and algorithmic processes, including their principles,

their software and hardware designs, their applications, and their impact on society while IS emphasizes functionality over design.

Any specific Information System aims to support operations, management and decision making. In a broad sense, the term is used to refer not only to the information and communication technology (ICT) that an organization uses, but also to the way in which people interact with this technology in support of business processes.

Some authors make a clear distinction between information systems, computer systems, and business processes. Information systems typically include an ICT component but are not purely concerned with ICT, focusing instead on the end use of information technology. Information systems are also different from business processes. Information systems help to control the performance of business processes.

Information system is a special type of work system. **A work system is a system in which humans and/or machines perform work using resources to produce specific products and/or services for customers.** An information system is a work system whose activities are devoted to processing (capturing, transmitting, storing, retrieving, manipulating and displaying) information.

An information system is a form of communication system in which data represent and are processed as a form of social memory. An information system can also be considered a semi-formal language which supports human decision making and action.

There are various types of information systems, for example: transaction processing systems, office systems, decision support systems, knowledge management systems, database management systems, and office information systems.

Critical to most information systems are information technologies, which are typically designed to enable humans to perform tasks for which the human brain is not well suited, such as: handling large amounts of information, performing complex calculations, and controlling many simultaneous processes.

"Information systems specialists are the people that integrate information technology solutions and business processes to meet the information needs of businesses and other enterprises.

Silver et al. (1995) provided two views on IS that includes software, hardware, data, people, and procedures. A second managerial view includes people, business processes and Information Systems.

1.3   ICT Literacy
Since we live in information society, everyone is expected to be ICT literate. The ICT literacy entails.

Awareness: As you study computers, you will become aware of their importance, versatility, pervasiveness, and their potential for good and ill in our society.

Knowledge: You will learn what computers are and how they work. This requires learning some technical jargons that will help you deal with the computer and with people that work with computers.

Interaction: This implies learning to use a computer to perform some basic tasks or applications.

1.4   Impact Of ICT On Society
There are both positive and negative impacts of ICT in this modern society. Some these impact are discussed below:

1.4.1   Positive Impacts
i.   **Faster Communication Speed**: In the past, it took a long time for any news or messages to be sent. Now with the Internet, news or messages are sent via e-mail to friends, business partners or to anyone efficiently. With the capability of bandwidth, broadband and connection speed on the Internet, any information can travel fast and at an instant. It saves time and is inexpensive.

ii. **Lower Communication Cost**: Using the Internet is cost-effective than the other modes of communication such as telephone, mailing or courier service. It allows people to have access to large amounts of data at a very low cost. With the Internet we do not have to pay for any basic services provided by the Internet. Furthermore, the cost of connection to the Internet is relatively cheap.

iii. **Reliable Mode of Communication**: Computers are reliable. With the internet, information could be accessed and retrieved from anywhere and at any time. This makes it a reliable mode of communication. However, the input to the computer is contributed by humans. If the data passed to the computer is faulty, the result will be faulty as well. This is related to the term GIGO. GIGO is a short form for Garbage In Garbage Out. It refers to the quality of output produced according to the input. Normally bad input produces bad output.

iv. **Effective Sharing of Information**: With the advancement of ICT, information can be shared by people all around the world. People can share and exchange opinions, news and information through discussion groups, mailing list and forums on the Internet. This enable knowledge sharing which will contribute to the development of knowledge based society.

v. **Paperless Environment**: ICT technology has created the term paperless environment. This term means information can be stored and retrieved through the digital medium instead of paper. Online communication via emails, online chat and instant messaging also helps in creating the paperless environment.

vi. **Borderless Communication**: Internet offers fast information retrieval, interactivity, accessibility and versatility. It has become a borderless source for services and information.

Through the Internet, information and communication can be borderless.

vii. **Create Employment**: Although many employment areas have suffered job losses, other areas have grown and jobs have been created. Some examples of areas where jobs have been created: IT Technicians: All of the computers in a business need to be maintained: hardware fixed, software installed, etc. IT technicians do this work. Computer Programmers: All of the software that is now used by businesses has to be created by computer programmers. Hundreds of thousands of people are now employed in the 'software industry' Web Designers: Much of modern business is conducted on-line, and company websites are very important. Company websites need to be designed and built which is the role of web designers.

1.4.2 Negative Effects

i. **Individualistic and introvert:** Nowadays, people tend to choose online communication rather than having real time conversations. People tend to become more individualistic and introvert.

ii. **Moral decedent and threats to the society**: Some ICT users use ICT tools for, fraud, identity theft, Pornography, Hacking etc. That could result to a moral decedent and generate threats to the society.

iii. **Health Problems:** A computer may harm users if they use it for long hours frequently. Computer users are also exposed to bad posture, eyestrain, physical and mental stress. In order to solve the health problems, an ergonomic environment can be introduced. For example, an ergonomic chair can reduces back strain and a screen filter is used to minimize eye strain.

iv. **Unemployment Situation:** Some jobs have been lost as a result of computers being used to do the same work that

people used to do, for examples: **Manufacturing**: Many factories now have fully automated production lines. Instead of using people to build things, computer-controlled robots are used. Robots can run day and night, never needing a break, and don't need to be paid! (Although the robots cost a lot to purchase, in the long-term the factory saves money.) **Secretarial Work:** Offices used to employee many secretaries to produce the documents required for the business to run. Now people have personal computers, they tend to type and print their own documents. **Accounting Clerks**: Companies once had large departments full of people whose job it was to do calculations (e.g. profit, loss, billing, etc.) .A personal computer running a spreadsheet can now do the same work. **Newspaper Printing**: It used to take a team of highly skilled printers to typeset (layout) a newspaper page and to then print thousands of newspapers. The same task can now be performed far more quickly using computers with DTP software and computer-controlled printing presses.

1.5 Review Questions

1. Compare Information Technology and Information System
2. Discuss Information System as special type of work system
3. Highlights any 5 examples of Information System
4. Who are the Information System Specialists?
5. What does ICT literacy entails?
6. Discuss any 5 positive and 5 negative impacts of ICT
7. What is the meaning of the acronym GIGO and what does it imply in computer jargon?

Chapter Two
Introduction to Computer System

2.1   Description of Computer System

C omputer is a device that is capable of automatically accepting (i.e. input), storing and processing data into useful information (i.e. output), at a very high speed, under the control of stored instructions (i.e. program). A computer could also be defined as a machine for manipulating data according to a list of instructions (programs). Computer is the backbone of ICT.

2.2   Parts of a Computer

If you use a desktop computer, you might already know that there isn't any single part called the "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 below shows the most common hardware in a desktop computer system. Your system may look a little different, but it probably has most of these parts. A laptop computer has similar parts but combines them into a single notebook-sized package.

2.2.1 System Unit

The system unit is the core of a computer system. Usually it's a rectangular box placed on or underneath your desk. Inside this box are many electronic components 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. Another component is random access memory (RAM), which temporarily stores information that the CPU uses while the computer is on. The information stored in RAM is erased when the computer is turned off. Almost every other part of your computer connects to the system unit using cables. The cables plug into specific ports (openings), typically on the back of the system unit. Hardware that is not part of the system unit is sometimes called a peripheral device or device.
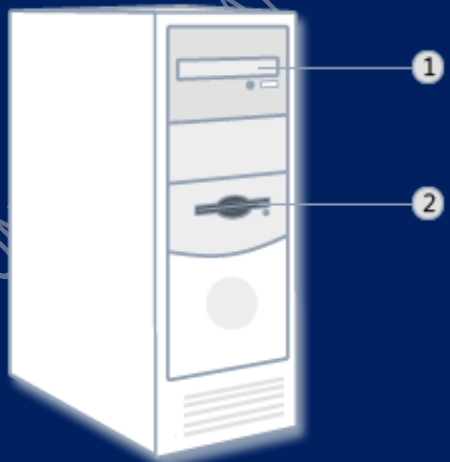
1 CD/DVD drive   2 Floppy disk drive

Figure 2a. System Unit

2.2.2 Storage
Computer has one or more disk drives—devices that store information on a metal or plastic disk. The disk preserves the information even when your computer is turned off.

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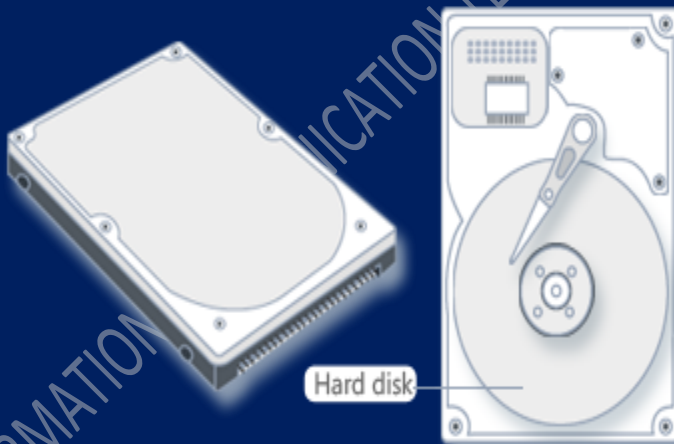

Hard disk

Figure 2b. Hard disk drive

2.2.4 CD and DVD Drives
Computers today come equipped with a CD or DVD drive, usually located on the front of the system unit. CD drives use lasers to read (retrieve) data from a CD, and many CD drives can also write

(record) data onto CDs. If you have a recordable disk drive, you can store copies of your files on blank CDs. You can also use a CD drive to play music CDs on your computer.

Figure 2c. CD

DVD drives can do everything that CD drives can, plus read DVDs. If you have a DVD drive, you can watch movies on your computer. Many DVD drives can record data onto blank DVDs.

2.2.5   Floppy disk drive

Floppy disk drives store information on floppy disks, also called floppies or diskettes. Compared to CDs and DVDs, floppy disks can store only a small amount of data. They also retrieve information more slowly and are more prone to damage. For these reasons, floppy disk drives are less popular than they used to be, although some computers still include them. Why are floppy disks "floppy"? Even though the outside is made of hard plastic, that's just the sleeve. The disk inside is made of a thin, flexible vinyl material
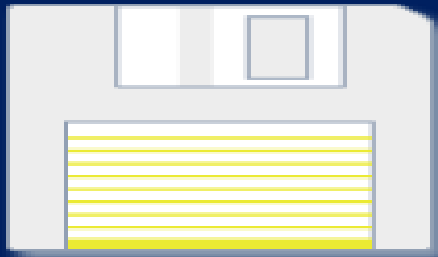
Figure 2d. Floppy disk

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2.2.6   Mouse

A mouse is a small device used to point to and select items on your computer screen. Although mice come in many shapes, the typical mouse does look a bit like an actual mouse. It's small, oblong, and connected to the system unit by a long wire that resembles a tail. Some newer mice are wireless. A mouse usually has two buttons: a primary button (usually the left button) and a secondary button. Many mice also have a wheel between the two buttons, which allows you to scroll smoothly through screens of information.

Figure 2e. Mouse

When you move the mouse with your hand, a pointer on your screen moves in the same direction. (The pointer's appearance might change depending on where it's positioned on your screen.)

When you want to select an item, you point to the item and then click (press and release) the primary button. Pointing and clicking with your mouse is the main way to interact with your computer.

2.2.7 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.
- The navigation keys, such as the arrow keys, allow you to move your position within a document or webpage.

Figure 2f. Keyboard

Note: We can also use your keyboard to perform many of the same tasks you can perform with a mouse.

2.2.8 Monitor

A monitor displays information in visual form, using text and graphics. The portion of the monitor that displays the information is called the screen. Like a television screen, a computer screen can show still or moving pictures.

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.
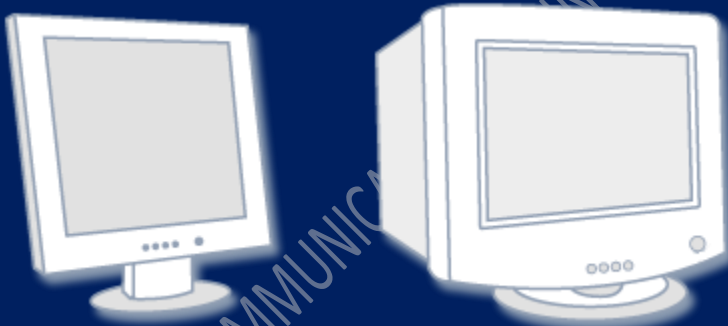
Figure 2g. LCD monitors (left); CRT monitor (right)

2.2.7. Printer

A printer transfers data from a computer onto paper. You don't need a printer to use your computer, but having one allows you to print e-mail, cards, invitations, announcements, and other materials. Many people also like being able to print their own photos at home. The two main types of printers are inkjet printers and laser printers. Inkjet printers are the most popular printers for the home. They can print in black and white or in full color and can produce high-quality photographs when used with special paper. Laser printers are faster and generally better able to handle heavy use.
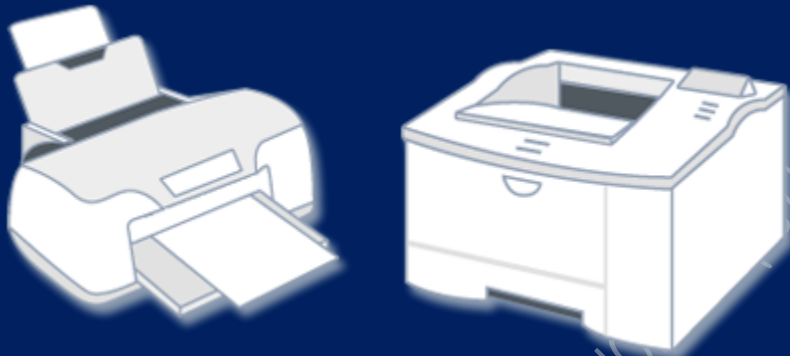
Figure 2h. Inkjet printer (left); laser printer (right)

2.2.9   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.

Figure 2i. Computer Speakers

2.2.9.   Modem

To connect our computer to the Internet, we 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.
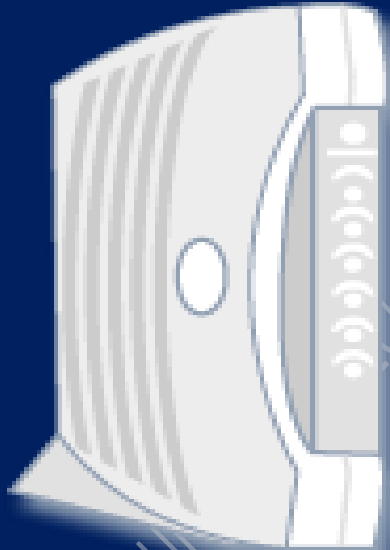
Figure 2j. Cable Modem

2.3 Advantages of Computer System

Below are some advantages of computer systems

i. **Accuracy and Reliability:** The results produced by a computer are extremely correct and reliable. What is often called 'computer errors' are actually human mistakes; invalid data and errors are corrected easily.

ii. **Speed**: The speed of computer makes it the machine ideal for processing large amounts of data; e.g. accounting, banking operations etc.

iii. **Storage/Memory Capability:** Computer systems can store tremendous amounts of data, which can then be retrieved fast

and efficiently. The volume of information we deal with today is far beyond what we can handle manually.

iv. **Productivity:** Computers are able to perform dangerous, boring, routine jobs, such as adding long list of numbers, punching holes in metal or monitoring water levels. Most workers (e.g. in banks) will appreciate increased productivity when computers are used to do their jobs.

v. **Flexibility:** Computer could be used for various purposes e.g. multiprogramming, batch processing, real-time processing, data collection, bank transaction processing etc.

vi. **Automatic operation**: Computer performs data processing automatically under the control of internally stored programs.

vii. **Configuration and adaptability:** Different or suitable peripherals may be used by business organizations to suit their business processing requirements.

2.4   Disadvantages of Computer System

Some of the dis-advantages of computers are discussed below

i. Cost of initial setup may be high.

ii. Cost of maintenance may be high.

iii. Inefficient feasibility study before implementation may hamper business operations.

iv. Lack of skilled personnel may hamper computer operations and results obtained.

v. Requires regular electrical power supply.

vi. Excessive exposure to computer may result in some health problem such as poor eye sight, wrist pain, back ache, neck pain etc.

vii. Computer virus attack may infect and destroy Data/information, which will automatically affect business operations.

viii.   It may lead to unemployment, because one computer can do the job of about 10 persons.

2.5   Application of Computer in Society

Computers have moved into many facets of our lives. There is virtually no area of human endeavor that computer usage has not penetrated. Though we cannot exhaust listing all the areas of application of computers, the following are some key areas of computer application:

i.   **Science**: One of the most important advantages of computers is in the field of science for research and development. The computers have played a major role in most of what we know about ourselves and the universe. The satellites, the telescopes and almost all the research tools make use of computers in some or the other way. The huge calculations required for space science, safe communication between scientists, storage of all the gathered information are some of the computer uses in science and technology.

ii.   **Medical**: The important use of computers in the medical field is for research and development. The high end machines used for diagnosis and cure of many diseases are nothing but computers. For example, the Magnetic Resonance Imaging (MRI), CT scan, ultrasound devices, etc are amongst the uses of computers in hospitals. Even many surgical procedures, known as laparoscopic surgeries, need the help of computers. Web conferencing helps doctors treat people remotely.

iii.   **Education**: Computer uses in the field of education are infinite. The Internet is a huge source of information. There are online universities that deliver online degrees and distance learning is spreading far and wide. Many schools and colleges have started making use of audio-visual ways of

imparting knowledge. A horde of tools that need a computer, help students in many ways.

iv. **Banking**: The banking sector has improved on fronts such as security, ease of use, etc. with the help of computers. Most of the banking operations can be done online, known as Internet banking, and you don't have to walk up to the bank for virtually anything. You can withdraw money from ATMs and deposit money in any branch, thanks to the networking affected by the use of computers. The complete banking experience has also become safer.

v. **Crime Investigation**: High end computer devices have ensured that justice is more effective. CCTV cameras and other computer operated security systems have reduced the amount of crime. And if it still happens there are many ways to track down the criminal in no time. Forensic science employs computers for many of its operations related to investigations.

vi. **Entertainment**: The field of entertainment has been revolutionized by computers. Animation, graphic image manipulation etc has made the entertainment experience hundred times better. Computer gaming is achieving new landmarks in terms of technology. Movie making, editing, music composition etc everything needs computers. This is only the tip of the iceberg and the uses of computers in society are many more. But then the development of computer technology has also given rise to many vices like identity theft.

vii. **Government**: The Government can use computers for the processing of immigration, tax collection/administration, keeping tracks of criminals, computing budgets and statutory allocations, Civil Service Records, computing wages, salaries, gratuities and pensions etc.

viii. **Communication**: Any computer has any potential to link up with other computers through communication systems such as telephone lines or satellite. This link-up facilitates exchange of memos, reports, letters, data/information, and even having meetings among people in geographically dispersed locations.

ix. **Robotics**: Robots are information machines with the manual dexterity to perform tasks too unpleasant, too dangerous, or too critical to assign to human beings. For example, robots are used in defense to perform underwater military missions; robots could be used for welding or paint-spraying in factories, and in car assembling.

x. **Business/Commerce**: Products are packaged with zebra-striped symbols (Universal Product Code {UPC}) that can be read by scanners at supermarket checkout stands to determine prices of commodities. It has become a commonplace for companies and consumers to transact business among themselves with the help of computers. It could be in form of Business-to-Business {B2B} or Business-to-Consumer {B2C}. Computers have been found useful in payroll preparation, inventory control, auditing operations, personnel records keeping, preparation of consumer utility bills, financial market transactions etc.

xi. **Energy**: Energy companies use computers and geological data to locate oil, coal, natural gas and other mineral resources. Meter-readers use hand-held computers to record how much energy is used in a month in homes and businesses. Computers can analyze the fuel consumption in our cars.

2.6   Types of Computer System
Classifications of computer vary and also depend on some criterion as discussed below:

Criterion 1: Types by Data Processed

There are three (3) types of computers according to this classification criterion:

i. Analog Computers: An analog computer measures and operates on data that are represented in the form of continuous variables e.g. voltage, pressure, temperature, distance, speed etc. Examples of analog computers include car speedometer, multimeter, fuel pump at filling stations etc.

ii. Digital Computers: A digital computer represents and processes data in discrete/numerical form, using binary system. It produces discrete output. Most computer systems we see around us today are digital computers; they are found in our homes and business environments. Some wrist watches today have digital computers embedded in them. Examples include desk calculators, adding machines, personal computers etc.

iii. Hybrid Computers: A hybrid computer combines the features of both analog and digital computers. It can accept continuous, discrete or both type of input. Its output could be in the form of discrete or continuous values or the combination of both. This type of computer is commonly found in highly scientific environments. Example is the electronic calculating scale used in food stores.

Criterion 2: Computer Types by physical size

In classifying computer according to physical size, there are four (4) types, namely and computers in this category are digital in nature:

i. Microcomputers: Microcomputers are the smallest in size; they are the cheapest; and they have the least operational speed and memory capacity. They are made for single user and single-tasking. They are portable (i.e. they can be moved about easily), easy and simple to learn and use. The

microprocessor of a microcomputer is made of integrated circuits, called chip, mounted a single circuit board. It has interfaces for input, output and storage devices. Examples include IBM Personal Computers and compatible systems, Compaq, Dell etc. Microcomputers come in different shapes and sizes: Personal Computer (PC) System: is a microcomputer designed for independent use by an individual at work or in the home mainly for business purposes. Some PCs are called Home Computers because they have limited capability designed for domestic use with programs that are typically used for computer games and controlling family finances.

ii. Minicomputers: Minicomputers are medium-sized, general-purpose digital computers; a bit larger than microcomputers but smaller than mainframe computers. They are multi-user (i.e. supports many users at a time) and multi-tasking (i.e. ability to perform many tasks simultaneously). Compared with microcomputers, they have larger memory size, higher processing speed, more numerous and faster input/output devices; and they are costlier. They are used in small-scale industries. Examples of mini-computer include: PDP-8, PDP-11, Honeywell-DPS6, DEC's VAX series, Texas instrument DS990, IBM 8100 etc.

iii. Mainframe computers: Mainframe computers are generally more powerful in terms of processing speed than minicomputers. They have larger memory storage memory/capacity and cost more than minicomputers. They are multi-user and multi-tasking oriented, supporting full range of programming languages, used for commercial and scientific research purposes, with sophisticated devices attached. They can access numerous terminals/workstations on a network. They use different types of peripheral devices such as tapes and disks. They are operated by well-trained

experts. Examples of mainframe computers include: NCR 8000, IBM 370,

iv. Super computers**:** Supercomputers are the largest, fastest and most expensive computers. They are often referred to as Maxi-computers. They can be seen as technological improvement on mainframe computers. They are often used in scientific environments such as in space studies and weather forecast. Examples include: CRAY-1, CRAY-2

Criterion 3: Computer Types by Purpose

There are two types of computers according to classification by purpose:

i. General purpose computers: General purpose computers are designed to solve wide range of problems such as science, technology, education, business etc. Complex calculations are performed within fractions of a second and results obtained fast. Most Personal Computers (PCs) are general purpose computers.

ii. Special purpose computers: Special purpose computers are designed for a particular job/purpose only; to solve problems of a restricted nature. They are also called dedicated computers. Most special purpose computers are put within some other devices or systems, such that the computers are not accessed directly. These types of computers are called Embedded Computers. Examples include computers designed for use in digital watches, micro-wave oven, in petrol pumps or in weapons guidance systems.

Criterion 4: Computer Types by generations/Technology Age

There are five (5) generations of computers as at date based on this criterion.

i. **First Generation Computers:** These are computer systems manufactured during the 1940s. Their features include:

- The CPU was made of vacuum tubes or thermionic valves.
- Primary memory made of magnetic drum.
- The Visual Display Unit (VDU) or monitor used cathode ray tube.
- Very bulky in size, occupied space, and very costly.
- Used machine language programming.
- Complex and cumbersome to operate.
- Generated a lot of heat.

Examples are: EDSAC, EDVAC, LEO, UNIVAC I and UNIVAC II.

ii. **Second Generation Computers**: These are computer systems manufactured during the 1950s. Their features include:
- The CPU was made of electronic transistors.
- Primary memory made of magnetic core.
- Cost less, faster, smaller and more reliable than first generation systems.
- Less complex and easier to operate compared with first generation.
- Generated less heat than first generation.

Examples: LEO Mark III, ATLAS, Honeywell 800, UNIVAC III, IBM 7000 series, etc.

iii. **Third Generation Computers:** These are computer systems manufactured around the 1960s and early 1970s.

Features:
- The CPU was made of Small Scale Integrated (SSI) Circuits, built on one Silicon Chip.
- The SSI circuits evolved to Medium Scale Integrated (MSI) circuits.
- The MSI eventually evolved into Large Scale Integrated (LSI) circuits, leading to greater degrees of integration of electrical components.

- The various evolutions of IC technologies gave rise to computer systems which were smaller in size, cheaper, faster, more reliable and durable than first and second generation systems.
- It was the era of minicomputers and microcomputers, resulting in higher awareness of computer technology.
- The VDU were in colours.
- Primary memory made of magnetic core and solid state semi-conductors.
- Less complex and easier to operate compared with first and second generations.
- Used high level language e.g. COBOL for operation.

Examples: ICL 1900 series, IBM 360 series etc.

iv. **Fourth Generation Computers:** These are computer systems manufactured around the late 1970s to 1985. Features include the following:
- The CPU was made of Very Large Scale Integrated Circuits (VLSIC), called microchips; i.e. thousands of components in a very small space.
- There was a thin line demarcation between third and fourth generations.
- The VLSI circuits gave rise to computer systems which were more compact, cheaper, faster, more reliable and durable than first, second and third generation systems.
- It was the era of microcomputers, resulting in higher awareness of computer technology.
- Invention of microprocessors, which gave birth to pocket calculators, digital watches and the inclusion of micro hips in other devices.
- Use of fourth generation query language (4GLs).
- The VDU were in various designs – RGB, EGA, CGA, VGA colour monitors.

- Primary memory made of solid state semi-conductors.
- Less complex and easier to operate compared with first and second generations.
- Evolution of more application areas of computers.

v.   **Fifth Generation Computers**

The research into the fifth generation computers started about 1985 and continued into 1990. The features are as follows:

- This generation is characterized by the advent of Artificial intelligence, i.e. the ability of computer system to exhibit behaviors like an intelligent person.
- Speech recognition/processing
- Parallel architecture/processing – where a computer system have hundreds of processors that could all be working on different parts of a single complex problem simultaneously.
- Pattern recognition –
- Expert system – an application program that has the capability of making judgments and decisions like a human expert in a particular field of profession. It is an interactive system that puts users through question-and-answer session to clarify issues and make recommendations, e.g. in medicine.
- Multimedia system – PC + Sound Card + Speakers + CD Drive
- Semi-conductor memory.

2.7   Social Implication Of Computer System

The society in which we live has been so profoundly affected by computers that historians refer to the present time as the information age. This is due to the ability to store and manipulate large amounts of information (data) using computers. As an information society, we must consider both the social and ethical implications of our use of computers. By ethical questions we mean asking what are the

morally right and wrong ways to use computers and this could be explain as follows:

Ergonomics: this is the science that studies safe work environments. Many health-related issues, such as carpal tunnel syndrome and computer vision syndrome (CVS), are related to prolonged computer use.

Environmental concern: Power and paper wastes are environmental concerns associated with computer use. Suggestions for eliminating these concerns include recycling paper and printer toner cartridges and turning off monitors and printers when not in use.

Employee monitoring: Employee monitoring is an issue associated with computers in the workplace. It is legal for employers to install software programs that monitor employee computer use. As well, e-mail messages can be read without employee notification. The invasion of privacy is a serious problem associated with computers.

Information: Because computers can store vast amounts of data we must decide what information is proper to store, what is improper, and who should have access to the information. Every time you use a credit card, make a phone call, withdraw money, reserve a flight, or register at school, a computer records the transaction. These records can be used to learn a great deal about you—where you have been, when you were there, and how much money was spent. Should this information be available to everyone?

Computers are also used to store information about your credit rating, which determines your ability to borrow money. If you want to buy a car and finance it at a bank, the bank first checks your credit records on a computer to determine if you have a good credit rating. If you purchase the car and then apply for automobile insurance, another computer will check to determine if you have traffic violations.

The Ethical Responsibilities of an IT Professional

IT (information technology) professional has responsibilities that relate to system reliability. System reliability involves installing and updating appropriate software, keeping hardware working and up-to-date and maintaining databases and other forms of data. Professional ethics helps a professional choose what to do when faced with a problem at work that raises a moral issue. One can certainly study what professionals do when faced with such problems, and confine the enquiry to the description. Our concern here, however, is to assist with making choices – an approach called prescriptive professional ethics.

Governments, schools, and employers rely on IT professionals to maintain their computer systems. In addition to ensuring system reliability, an IT professional must take responsibility for the ethical aspects of the career choice. The lists below are the most commonly reported behaviors IT professional which is unethical;

  i. Plagiarism
 ii. Failure to protect confidential data
iii. Failure to share credit on a report
 iv. Fabrication of data
  v. Criticize the ability/integrity of colleague for own gain
 vi. Holding back or disguising data
vii. Design of sampling strategy to favor a specific outcome
viii. Destruction of data that contradicts desired outcome
 ix. Deliberately not reporting an incident

2.8 Review Question

1. Describe briefly the term computer system
2. Write briefly on the following;
     i. System unit
    ii. Storage
   iii. Hard disk drive

       iv.   Mouse
       v.   Keyboard
       vi.   Monitor
       vii. Printer
       viii. Modem

3. Discuss any 5 major advantages of computer system
4. Discuss any 5 factors that can hindered the application of computer in business organizations
5. Explain some areas of application of computer in our society
6. Discuss classification of computer system based on types of data been processed
7. What are the basic features of first generation of computers
8. Identify some ethics expected of IT professionals
9. Discuss social implication of computer based on Ergonomics and Environmental concern

Chapter Three
Computer Evolution

3.1 Computer History And Development

Nothing epitomizes modern life better than the computer. For better or worse, computers have infiltrated every aspect of our society. Today computers do much more than simply compute: supermarket scanners calculate our grocery bill while keeping store inventory; computerized telephone switching centers play traffic cop to millions of calls and keep lines of communication untangled; and automatic teller machines (ATM) let us conduct banking transactions from virtually anywhere in the world. But where did all this technology come from and where is it heading to? To fully understand and appreciate the impact computers have on our lives and promises they hold for the future, it is important to understand their evolution. Some of the events that lead to the evolution of computer are described as follows.

Early Computing Machines and Inventors

The abacus was emerged about 5,000 years ago in Asia Minor and is still in use today, may be considered the first computer. This device allows users to make computations using a system of **sliding beads arranged on a rack**. Early merchants used the abacus to keep trading transactions. But as the use of paper and pencil spread, particularly in Europe, the abacus lost its importance. It took nearly 12 centuries, however, for the next significant advance in computing devices to emerge. In 1642, Blaise Pascal (1623-1662), the 18-year-

old son of a French tax collector, invented what he called a numerical wheel calculator to help his father with his duties. This brass rectangular box, also called a Pascaline, used eight movable dials to add sums up to eight figures long. Pascal's device used a base of ten to accomplish this. For example, as one dial moved ten notches, or one complete revolution, it moved the next dial - which represented the ten's column - one place. When the ten's dial moved one revolution, the dial representing the hundred's place moved one notch and so on. The drawback to the Pascaline, of course, was its limitation to addition.
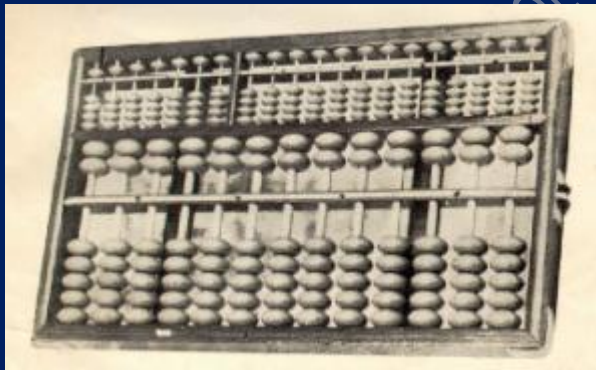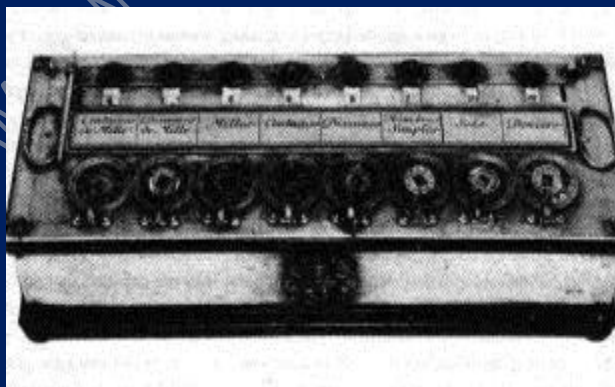

Figure 3a. Abacus Device

Figure 3b. Pascaline

In 1694, a German mathematician and philosopher, Gottfried Wilhem von Leibniz (1646-1716), improved the Pascaline by creating a machine that could also multiply. Like its predecessor, Leibniz's mechanical multiplier worked by a system of gears and dials. Partly by studying Pascal's original notes and drawings, Leibniz was able to refine his machine. The centerpiece of the machine was its stepped-drum gear design, which offered an elongated version of the simple flat gear. It wasn't until 1820, however, that mechanical calculators gained widespread use. Charles Xavier Thomas de Colmar, a Frenchman, invented a machine that could perform the four basic arithmetic functions. Colmar's mechanical calculator, the arithometer, presented a more practical approach to computing because it could add, subtract, multiply and divide. With its enhanced versatility, the arithometer was widely used up until the First World War. Although later inventors refined Colmar's calculator, together with fellow inventors Pascal and Leibniz, he helped define the age of mechanical computation.
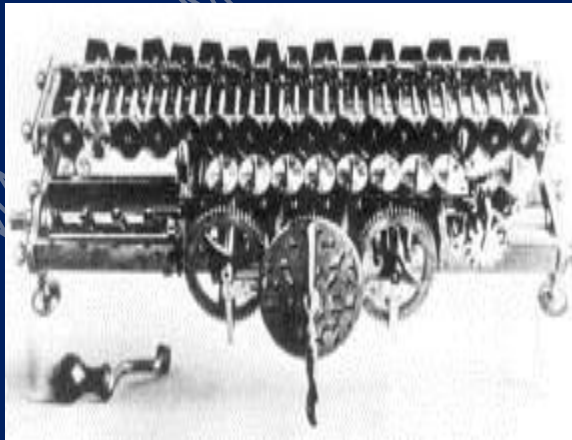

Figure 3c. Leibniz Machine

The real beginnings of computers as we know them today, however, lay with an English mathematics professor, Charles Babbage (1791-1871). Frustrated at the many errors he found while examining calculations for the Royal Astronomical Society, Babbage declared, "I wish to God these calculations had been performed by steam!" With those words, the automation of computers had begun. By 1812, Babbage noticed a natural harmony between machines and mathematics: machines were best at performing tasks repeatedly without mistake; while mathematics, particularly the production of mathematics tables, often required the simple repetition of steps. The problem centered on applying the ability of machines to the needs of mathematics. Babbage's first attempt at solving this problem was in 1822 when he proposed a machine to perform differential equations, called a Difference Engine. Powered by steam and large as a locomotive, the machine would have a stored program and could perform calculations and print the results automatically. After working on the Difference Engine for 10 years, Babbage was suddenly inspired to begin work on the first general-purpose computer, which he called the Analytical Engine. Babbage's assistant, Augusta Ada King, Countess of Lovelace (1815-1842) and daughter of English poet Lord Byron, was instrumental in the machine's design. One of the few people who understood the Engine's design as well as Babbage, she helped revise plans, secure funding from the British government, and communicate the specifics of the Analytical Engine to the public. Also, Lady Lovelace's fine understanding of the machine allowed her to create the instruction routines to be fed into the computer, making her the first female computer programmer. In the 1980's, the U.S. Defense Department named a programming language ADA in her honor.
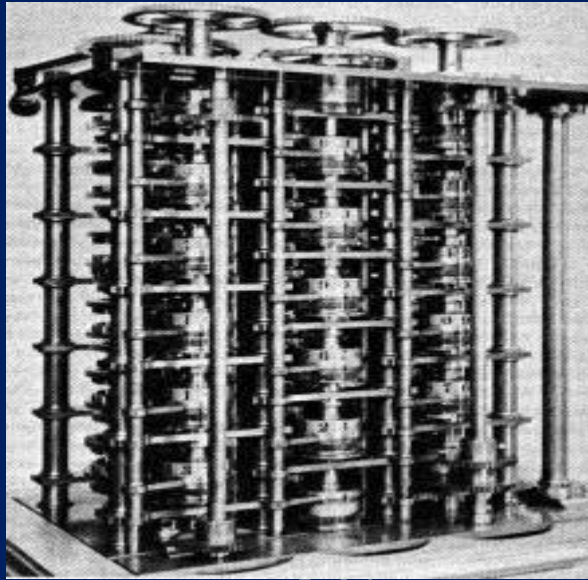
Figure 3d. Babbage Machine

Babbage's steam-powered Engine, although ultimately never constructed, may seem primitive by today's standards. However, it outlined the basic elements of a modern general purpose computer and was a breakthrough concept. Consisting of over 50,000 components, the basic design of the Analytical Engine included input devices in the form of perforated cards containing operating instructions and a "store" for memory of 1,000 numbers of up to 50 decimal digits long. It also contained a "mill" with a control unit that allowed processing instructions in any sequence, and output devices to produce printed results. Babbage borrowed the idea of punch cards to encode the machine's instructions from the Jacquard loom. The loom, produced in 1820 and named after its inventor, Joseph-Marie Jacquard, used punched boards that controlled the patterns to be woven.
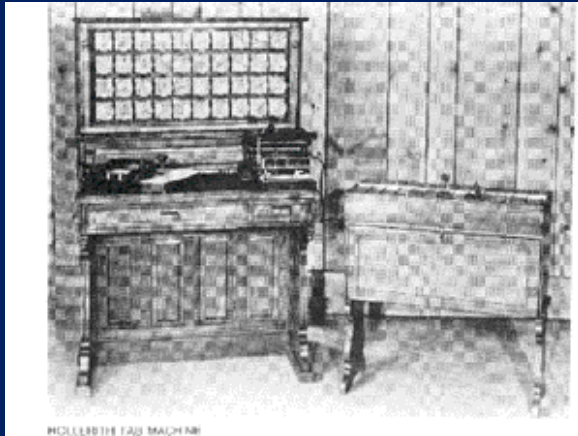
Figure 3e. Hollerith Machine

In 1889, an American inventor, Herman Hollerith (1860-1929), also applied the Jacquard loom concept to computing. His first task was to find a faster way to compute the U.S. census. The previous census in 1880 had taken nearly seven years to count and with an expanding population, the bureau feared it would take 10 years to count the latest census. Unlike Babbage's idea of using perforated cards to instruct the machine, Hollerith's method used cards to store data information which he fed into a machine that compiled the results mechanically. Each punch on a card represented one number, and combinations of two punches represented one letter. As many as 80 variables could be stored on a single card. Instead of ten years, census takers compiled their results in just six weeks with Hollerith's machine. In addition to their speed, the punch cards served as a storage method for data and they helped reduce computational errors. Hollerith brought his punch card reader into the business world, founding Tabulating Machine Company in 1896, later to become International Business Machines (IBM) in 1924 after a series of mergers. Other companies such as Remington Rand and Burroghs also manufactured punch readers for business use. Both

business and government used punch cards for data processing until the 1960's.

In the ensuing years, several engineers made other significant advances. Vannevar Bush (1890-1974) developed a calculator for solving differential equations in 1931. The machine could solve complex differential equations that had long left scientists and mathematicians baffled. The machine was cumbersome because hundreds of gears and shafts were required to represent numbers and their various relationships to each other. To eliminate this bulkiness, John V. Atanasoff (1903), a professor at Iowa State College (now called Iowa State University) and his graduate student, Clifford Berry, envisioned an all-electronic computer that applied Boolean algebra to computer circuitry. This approach was based on the mid-19th century work of George Boole (1815-1864) who clarified the binary system of algebra, which stated that any mathematical equations could be stated simply as either true or false. By extending this concept to electronic circuits in the form of on or off, Atanasoff and Berry had developed the first all-electronic computer by 1940. Their project, however, lost its funding and their work was overshadowed by similar developments by other scientists.

3.2   Personal Computers History and Development

The personal computer (PC) has revolutionized business and personal activities and even the way people talk and think; however, its development has been less of a revolution than an evolution and convergence of three critical elements - thought, hardware, and software. Although the PC traces its lineage to the mainframe and minicomputers of the 1950s and 1960s, the conventional thought that was prevalent during the first thirty years of the computer age saw no value in a small computer that could be used by individuals. A PC is a microcomputer, so named because it is smaller than a minicomputer, which in turn is smaller than a mainframe computer. While early mainframes and their peripheral devices often took up

the floor space of a house, minicomputers are about the size of a refrigerator and stove. The microcomputer, whose modern development traces back to the early 1970s, and fits on a desk, from the start, the creation of the computer was centered on the concept that a single unit would be used to perform complex calculations with greater speed and accuracy than humans could achieve. On December 23, 1947, one of the most far-reaching technologies of the 20th Century was developed at Bell Laboratories by John Bardeen, Walter Brattain, and William Shockley - the transistor. But the transistor wasn't available to U.S. manufacturers until 1956, when a seven year-old antitrust law suit against AT&T, the owners of Bell Labs, was settled. The judgment required that AT&T give away licenses to manufacture the transistor to American companies. Following this decision, the transistor was used to replace thousands of vacuum tubes in computers and began the miniaturization of electronics. Because it drastically reduced the size and heat considerations of the large vacuum tubes, the transistor enabled the computer to become a viable tool for business and government.

3.3 The Computer Mystique

From the beginning, computers baffled the populous with their capability. In corporate and government offices and on university campuses, information processing departments sprouted up to serve the computer. The IBM 701, which was introduced in 1952 as a business computer, was comprised of several units that could be shipped and connected at a customer's location, rather than the earlier massive units that had to be assembled on site. In 1953, IBM began shipping the first mass-produced computer, the IBM 650. IBM introduced the first solid-state (transistorized) computer in 1959, the IBM 7090. Then in 1964, IBM culminated over $1 billion in research when it brought out the System/360 series of computers. Unlike other mainframes, the System/360 computers were compatible with each other.

By 1960, the computer was king. Companies hired armies of technicians and programmers to write its operating programs and software, fix it, and allocate the precious computer time. The capability of the machines was more than a mere mortal could fathom, but gathering raw data and "keying" it in so the computer could "crunch the numbers" was a complicated and time-consuming task.

Frustrations abounded, computer errors were called "glitches," and the phrases "garbage in/garbage out," "It's a computer mistake," and "Sorry, the computer's down and we can't do anything," were introduced into the lexicon.

On college campuses in the 1960s, students carried bundles of computer cards to and from class, hoping that their share of the valuable computer time would not be bumped or allocated to someone else. The term, "Do not fold, spindle or mutilate," was coined so people wouldn't disable the process of feeding the punched computer cards into punch card readers, where the intricate patterns of holes were decoded.

The computer mystique was reinforced in people every time they heard of some new accomplishment. In 1961, a computer calculated the value of pi to 100,000 decimal places. A computer could play checkers, and in 1967 a chess playing computer program was made an honorary member of the United States Chess Federation. Banks began printing checks with magnetic ink so they could be processed by the computers.

3.4   New Technologies And Ideas

Until 1971, nobody even thought of a computer as anything but a big, fast, electronic brain that resided in a climate-controlled room and consumed data and electricity in massive quantities. In 1971, an Intel 4004 chip containing 4004 transistors was programmed to perform complex mathematical calculations; the hand-held calculator was born. Suddenly, scientists and engineers could carry

the computational power of a computer with them to job sites, classrooms, and laboratories; but the hand-held calculator, like the ENIAC before it, was not yet a computer. The microprocessor was developed by Robert Noyce, the founder of Intel and one of the inventors of the integrated circuit, and brought with it a change in the way people worked.

Small, hand-held calculators had provided an idea, or at least a "what if," to some people. Still, in the early 1970s, computers were used for number crunching and printing out long streams of green and white paper. IBM electric typewriters were the top of the line "word processors" and Xerox copiers churned out photocopies. Most people never imagined that a computer could process data in real time, be used to write letters, or fit on a desk.

In 1972, Intel brought out its 8008 chip, capable of processing 8-bits of data, enough to convey numbers and letters of the alphabet. In that same year, Xerox began working on a personal computer at their Palo Alto Research Center. For the next several years, a team of Xerox scientists worked on the "Alto," a small computer that would have become the first PC if only the development team had been able to convince someone of its usefulness.

Likewise, in 1972 Digital Equipment Corporation (DEC), a minicomputer manufacturing company headed by Kenneth Olsen, had a group of product engineers developing the DEC Datacenter. This PC incorporated not only the computer hardware but the desk as well. The DEC Datacenter could have put tremendous computing capability in the home or at work, but management saw no value to the product and halted its development.

In the end, none of the giant companies whose names had been synonymous with computers would introduce the PC to the world. There seemed to be no future in an inexpensive product that would replace the million dollar "Big Iron" that they were selling as fast as they could make them.

The people who eventually introduced the PC were rebels. Many had spent time in the bowels of the big companies and were frustrated by the lack of vision they encountered. They retreated into their own garages and attended meetings with other "computer nuts" who saw a much different future than the one laid out over the previous 30 years by the giants of the computer industry.

3.5   The Birth Of Personal Computer

In 1975, Rubik's Cube was put on store shelves and proved to many that the human brain was incapable of complex problem solving. But a ray of hope also appeared; the first PC was introduced. Micro Instrumentation and Telemetry Systems, Inc. (MITS) sold a kit for the MITS Altair 8800 that enabled computer hobbyists to assemble their own computers. It had no monitor, no keyboard, no printer, and couldn't store data, but the demand for it, like Rubik's Cube, was overwhelming.

The Altair proved that a PC was both possible and popular, but only with those people who would spend hours in their basements with soldering irons and wire strippers. The Altair, which looked like a control panel for a sprinkler system, didn't last, but it helped launch one of the largest companies in the computer world and gave a couple of young software programmers a start. In 1974, Bill Gates and Paul Allen wrote a version of BASIC for the Altair and started a company called Microsoft Corporation.

In 1976, another computer kit was sold to hobbyists - the Apple I. Stephen Wozniak sold his Volkswagen and Steve Jobs sold his programmable calculator to get enough money to start Apple. In 1977, they introduced the Apple II, a pre-assembled PC with a color monitor, sound, and graphics. It was popular, but everyone knew that a serious computer didn't need any of this. The kits were just a hobby and the Apple II was seen as a toy. Even the Apple name wasn't a serious, corporate sounding name like IBM, Digital Equipment Corporation, or Control Data.

But 1977 also brought competition. The Zilog Z-80 microprocessor, which had been introduced in 1975, was used in the Tandy Radio Shack TRS-80, affectionately called the "Trash 80." Apple, Commodore, and Tandy dominated the PC marketplace. The Apple II had 16K bytes of RAM and 16K bytes of ROM; Commodore Business Machines' Personal Electronic Transactor (PET) included 4K RAM and 14K ROM; and the TRS-80 had 4K RAM and 4K ROM.

Also in 1977, the Central Program for Microprocessors (CP/M) operating system was developed by Digital Research and Gary Kildall. From its introduction until 1980, CP/M was used in most PCs, but even that did not guarantee that a program or document could be written on one machine and read on another because each manufacturer used different floppy disk drives.

Apple introduced the floppy disk drive in 1978, allowing Apple II users to store data on something other than the cumbersome and unreliable tape cassettes that had been used up to that point. But despite the popularity of the three PCs, non-computer people still saw little reason to buy an expensive calculator when there were other ways to do the same things. In 1979, that all changed.

When VisiCalc was introduced for the Apple II, non-computer people suddenly saw a reason to buy a computer. VisiCalc, a spreadsheet program created by Dan Bricklin and Bob Frankston, allowed people to change one number in a budget and watch the effect it had on the entire budget. It was something new and valuable that could only be done with a computer. For thousands of people, the toy, the computer few could find a use for, had been transformed into a device that could actually do something worthwhile.

Microprocessors and high-tech gadgets were gradually worming their way into people's lives. In 1978, Sony introduced the Beta format video cassette recorder and a year later the VHS video recorder and the Sony Walkman. And to remind everyone of how

far we had to go, Star Trek: The Motion Picture came to theaters in 1979.

The Sinclair ZX-80 PC, which hit the market in 1980, used the same Z-80 chip as Commodore's PET and the Tandy TRS-80. The ZX-80 had 1K RAM and 4K ROM. Developed by British entrepreneur Clive Sinclair, the ZX-80 meant that people could enter the computer revolution for under $200. Its small size and price attracted people who had never thought about owning a PC.

The Commodore VIC-20, also introduced in 1980, had a color monitor and would eventually become the first PC to sell more than one million units. Even with all of the success the early PC manufacturers had in the late 1970s and early 1980s, the advances in microprocessor speeds, and the creation of software, the PC was still not seen as a serious business tool. Unknown to everyone in the computer industry; however, a huge oak tree was about to drop an acorn that would fall close to the tree and change everything.

Two events occurred in 1981 that would have a tremendous impact on the future of the PC. In 1980, IBM had started a secret project in Boca Raton, Florida called "Acorn." Thirteen months later, in 1981, IBM introduced the IBM PC, a product that validated the PC as a legitimate business tool. For many people, even those who prided themselves on being able to operate the "Big Iron," if IBM was making PCs then the small desk-top units were worthy of respect.

When the IBM PC hit the market, it was a complete system. Secretly, IBM had provided software developers with prototypes of their PC so they could develop an array of programs that would be available when the machine hit the streets. IBM also developed printers, monitors, and expansion cards for the PC and made it an open system so other manufacturers could develop peripherals for it. The IBM PC used an Intel 8088 microprocessor, had 16K of RAM, was expandable to 256K, came with one 5.25-inch disk drive and room for a second, and was available with a choice of operating

systems; CP/M-86 or IBM PC-DOS, which had been developed by Microsoft.

The second major event of 1981 was the introduction of the first luggable computer, the Osborne 1. This self-contained, suitcase-sized PC, developed by Adam Osborne, was not only the first portable PC, but also the first to be sold with software. The Osborne I came with BASIC, CBASIC, WordStar for word processing, and the SuperCalc spreadsheet program. Over the next two years, the Osborne Computing Company would go from nothing to a company with $70 million in annual revenue and then into bankruptcy.

Prior to 1980, the most common method of storing data was to connect an audio tape recorder to the PC and dump data to standard tape cassettes. Large word processors and some PCs had 8-inch disk drives, but in 1980 Al Shugart introduced the Winchester hard-disk drive. The microprocessor, an amazing technology when it had 4000 transistors on a single chip, is now even more amazing when it has over 3 billion transistors on an even smaller chip. In 1982, when Time magazine made the computer its "Man of the Year," the PC was still in its infancy. "Big Iron" still dominated the high-tech environment and having a personal computer was a luxury.

The creation and success of the PC would not have been possible without the elimination of the concept that a computer was a large, centralized, data processor and number cruncher. Today the PC is a communication channel more than it is a computational tool. Millions of people work in their "electronic cottages," either operating their own business from home or telecommuting to work. It is strange that one of the first Intel 4004 microprocessors ever made continues to operate and lead the world to the outer edges of time and space. In 1972 one of the small chips was installed in the Pioneer spacecraft. Today it continues to operate over 5 billion miles from earth.

3.6   Industrial Contribution To Evolution Of Computer

The early 1980s were a time of furious change in the computer industry. More than 100 companies were manufacturing PCs, each with its own unique features, each with its own software. When IBM entered the market in 1981, software companies knew that writing IBM compatible software would be profitable. Software for the Apple II had exploded to 16,000 titles and IBM would do the same. New software in the 1980s included WordStar, Lotus 1-2-3, Microsoft Word, and Word Perfect.

In 1981, Hayes Micromodem brought the MOdulator/DEModulator (MODEM) to the market for PCs. The modem had been invented at AT&T Bell Labs in 1960 to connect mainframes and minicomputers. Hayes' modem allowed PCs to communicate with each other and access CompuServe and The Source, the online services that started up in 1979. CompuServe showed people what to do with their 300 baud modems by offering them an array of services and databases to connect with.

In 1982 Compaq introduced the first IBM compatible machine. Until Compaq, most manufacturers feared IBM and would not bring out a machine that was compatible with the PC. Later the compatibles would be termed "clones."

Also in 1982, Tandy brought out the TRS-80 Model 16, which was based on the Motorola 68000 and Z-80 microprocessors. The Model 16 retailed for $5,000 and included 128K RAM, an 8-inch floppy disk drive, as well as the Xenix operating system, a derivative of UNIX.

In January, 1983 Time magazine anointed the PC as the "Man of the Year," a designation by the editors that the computer had been the most influential newsmaker of 1982. The magazine estimated 80 million PCs would be in use by the end of the century. Industry leaders included Texas Instruments, Timex, Commodore, Atari, Apple, IBM, and Tandy, with Osborne leading the way in the portable market. The individuals pushing the PC into the future were John Opel at IBM, Adam Osborne of Osborne Computers, VisiCalc

creator Dan Bricklin, Jack Tramiel of Commodore, and Clive Sinclair who founded Sinclair Research.

The leading products of 1982 and their sales figures included the Timex/Sinclair 1000 - 600,000; Commodore VIC-20 - over 600,000, Atari 400 and Atari 800 - 600,000; Texas Instruments 99/4A - 530,000; TRS-80 Model III - 300,000; Apple II Plus - 270,000; IBM PC - 200,000; and Osborne 1 - 55,000. These computers ranged in price from the $99 Timex/Sinclair to the Osborne 1 at $1,795 with bundled software. In the opinion of Time, computers priced over $2,000 would appeal to a market of "…growing small businesses and big corporate clients…" Manufacturers of these higher end PCs included Altos, Corvus, Cromemco, Control Data, Digital Equipment, Hewlett-Packard, North Star, Olivetti, Tele Video, Toshiba, Xerox, and Zenith.

In 1983, there was once again a wind of change blowing across the PC landscape. Apple brought out a machine that failed to sell but nonetheless showed consumers and manufacturers a new direction for the PC. The Lisa, an expensive PC with a graphical user interface (GUI), hit the market with a thud. At $10,000, it had few friends and even fewer buyers. Also in 1983, IBM introduced IBM XT with a 10MB hard drive, three additional expansion slots, 128K RAM, and a 360K floppy drives. To many buyers, the 10MB storage capacity seemed large enough to last a lifetime.

Immediately after the failure of Lisa, Steven Jobs rethought the machine and in 1984, out came the Macintosh. The Macintosh was powered by Motorola's 68000 processor and came with 128K of RAM. It was so radically different from any other PC that it split the PC world into two halves that would not be rejoined for another decade. In addition to the GUI that made the computer an "intuitive" extension of the user, the "Mac" had its own operating system that was incompatible with IBM's MS-DOS system. Suddenly PC meant DOS-based and IBM compatible and Mac meant GUI and mouse.

The Mac was introduced to the world in an extravagant television commercial that was shown only once during half-time of the NFL Super Bowl. The commercial changed the advertising industry almost as much as the Mac changed computing. Suffering from the failure of the Apple III and Lisa, Apple was literally saved by the Mac. People who hated computers loved the simplicity of Mac. The GUI allowed the user to click a mouse button on an icon to launch a program, print a document, or copy a file. No longer did users have to know combinations of keys or special codes to get the computer to do what they wanted it to do. The Mac was "user friendly."

When Apple came out with the Apple LaserWriter in 1985 it was with Adobe Systems Inc.'s PostScript page description language. By 1986, with its what-you-see-is-what-you-get (WYSIWYG) display and printing, desk-top publishing was born. WYSIWYG meant that a person could format a document with special fonts and spacing and be assured that what came out of the printer would look like what they had created on the screen.

Adobe, founded in 1982 by John Warnock and Charles Geschke, turned the printed page into a graphic image. The bit map made each pixel on the screen a definable image that could be moved and changed without the limitations of a standard text format. PostScript changed the way people thought about fonts, page layout, and the visual impact of the documents they produced with their PC. Printers like the Apple LaserWriter and the Hewlett-Packard HP LaserJet made every document look like it had been professionally typeset and printed.

In 1985, the Commodore Amiga 1000, which featured multitasking, graphics, sound, and video in a windowing operating system, exposed people to multimedia. At the same time Toshiba came out with the T1100 laptop, Tandy introduced the Tandy 200 laptop, and AT&T introduced the UNIX PC. Intel took the microprocessor to a new level when it brought out the 386 microprocessor in 1985,

proving that PCs were not only getting better, they were getting faster.

The 1980s were very active times for hardware manufacturers and software producers. Small software companies locked in with either IBM or Macintosh, but large companies like Microsoft were able to create new applications for both operating systems. While Aldus brought out PageMaker, and Lotus introduced Jazz, Microsoft announced Excel for the Mac, C 3.0, and finally shipped a long-awaited program called Windows.

Bill Gates, a founder of Microsoft, tried three times to interest IBM in Windows but was turned down each time. Although the Mac operating system had changed the interface between users and their PCs, many DOS users continued to hang on to their command line-driven MS-DOS operating system, and it would be several more years until the Windows concept caught on.

With the availability of hundreds of software programs, hard disk space became valuable real estate. The 10MB hard disk on the IBM XT began to fill up so hard drive manufacturers started the process of doubling their capacity.

As modems proliferated and the Hayes Smart modem was accepted as the standard for modems, just about everyone either knew someone they could get online with, subscribed to an online service such as CompuServe, or wanted to access the 1000 host sites on the Internet. But PCs that were connected to the outside world were also vulnerable to a new phenomenon called viruses. Once downloaded, these programs could attach themselves without warning to a PC's hard drive and gradually or in the blink of an eye destroy or overwrite files. Virus checkers then became the rage for anyone who received data over telephone lines.

By 1987 enough people were writing their own software and sharing it that the Association of Shareware Professionals was formed to market and protect the inexpensive software. In 1987 a new

computer language, C++, stimulated the growth of object-oriented programming (OOP).

In 1990, Intel's 386 and Motorola's 68030 microprocessors were at the top, then in 1991 Intel brought out the i486SX 20 MHz chip and Motorola introduced the 68040. Less than a year later Intel introduced the 50MHz 486 chip and Tandy brought out its $400 CD-ROM drive for PCs. Then, just to make everyone wonder what was going on, in 1991 Apple and IBM agreed to share technology by integrating the Mac into IBM's systems and using the IBM Power PC chip.

In 1992, Apple brought out the Apple PowerBook, a laptop that made everyone wonder just how small a full-function computer could get. A year later everyone knew the answer when Apple introduced the Newton Personal Digital Assistant (PDA). The Newton was supposed to be able to recognize hand-written notes and Apple sold 50,000 of them in 10 weeks.

In 1993, Intel introduced the 60MHz Pentium chip, the next generation of chips. The Pentium; however, had a nasty mathematical bug and its acceptance was slowed. Apple discontinued the workhorse of its fleet, the Apple II, which, despite the mind boggling changes in the industry, had lasted 17 years. From its inception in 1975, the PC has become a focal point of business, education, and

3.7   Review Questions

1.   In not more than 3 sentences, summarize the roles of the following individual in evolution of computer
     i.   Abacus
    ii.   Blaise Pascal
   iii.   Gottfried Wilhem von Leibniz
    iv.   Charles Xavier Thomas de Colmar
     v.   Charles Babbage

      vi.   John V. Atanasoff
     vii.   Lady Lovelace's
    viii.   John Bardeen, Walter Brattain, and William Shockley
     ix.   Robert Noyce
      x.   Kenneth Olsen

2. What is the basic drawback to Pascaline?
3. Discuss the role of IBM and Intel on modern computer technology
4. Juxtapose the statement "The people who eventually introduced the PC were rebels"
5. Discuss briefly the features of Osborne 1 computer

Chapter Four
Computer Hardware System

4.1   Description Of Hardware

Desktop computer before is really a system of many parts working together. The physical parts, which you can see and touch, are collectively called hardware.

The figure below shows the most common hardware in a desktop computer system. Your system may look a little different, but it probably has most of these parts. A laptop computer has similar parts but combines them into a single notebook-sized package.

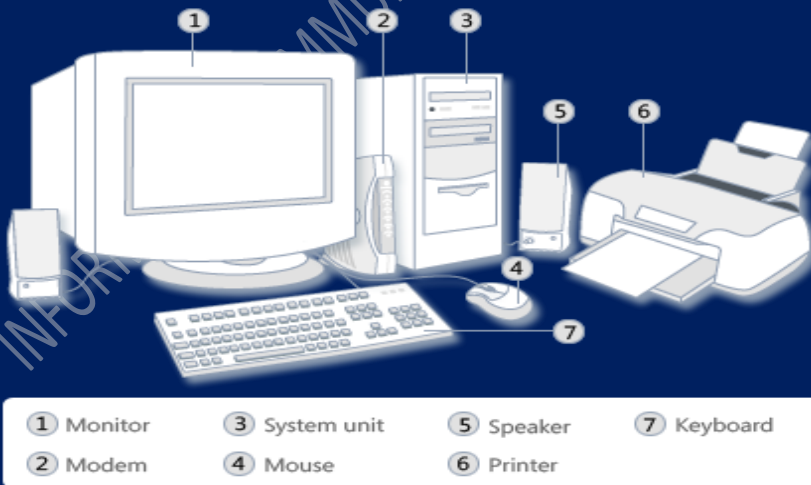| ① Monitor | ③ System unit | ⑤ Speaker | ⑦ Keyboard |
| ② Modem | ④ Mouse | ⑥ Printer | |

Figure 4a: The Computer System

The computer system components parts were described in chapter 2 of this book and almost all the components described are parts of computer hardware. In this chapter the computer hardware will be describe based on the computer hardware configuration which include both the directly visible and invisible hardware. This hardware configuration is as given in figure 4b below.
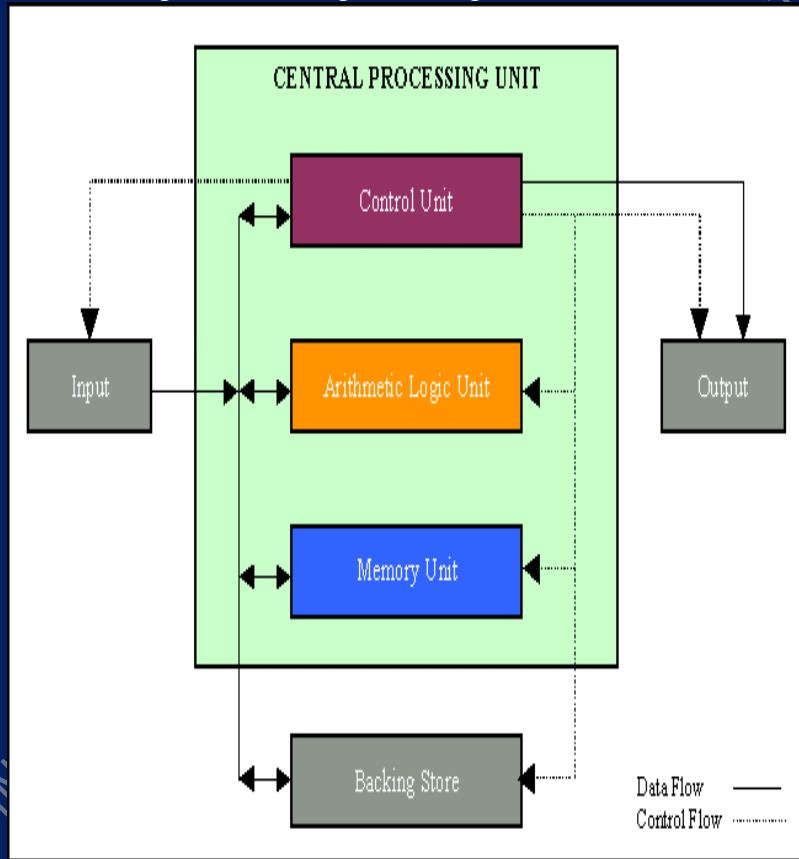

Figure 4b. Computer Hardware Configuration

Note: Computer Hardware can be divided basically into two; the CPU and Peripherals. CPU is made up of control unit, Arithmetic

and logic unit and Main memory. While the peripheral is made up of Input devices, Output devices and Backing storage.

The components of computer hardware based on the diagram in figure 4b are the CPU and Peripherals (input and output units). Some of the peripherals were described in chapter two of this book.

4.2   Central Processing Unit

This is an integral part of system unit of computer system that made up of other components like; the main storage, the control unit and the arithmetic/logic unit.

Main Storage

The Main Storage contains two types of memory chips, named the Random-Access Memory (RAM) and Read-Only Memory (ROM). *RAM* is a memory that has the same access time for all locations. It is used to store data and program temporarily whenever they are needed in main memory. It is constantly being re-used for different data items or programs as required. Static RAM holds its memory so long as there is a power supply. Dynamic Ram (DRAM) has to be refreshed by reading and rewriting the contents very frequently. RAM is volatile, that is, the con-tents of RAM are lost when the power supply is switched off. *ROM* (integrated circuit) is used to store vital data and programs which need to be held within the main memory at all times. The contents of ROM are permanently set during the manufacture of the computer.

However, there are other ways of putting programs and data into ROM. Programmable Read-Only Memory (PROM) is a type of ROM that is manufactured as an empty storage array and is later permanently programmed by the user. Erasable PROM (EPROM) is a type of PROM whose data can be erased by a special process so new data can be written as if it were a new PROM.

Arithmetic/Logic Unit (ALU)

The Arithmetic/Logic Unit (ALU) consists of adder/subtractor, electronic circuit and working registers to which operands may be transferred during an operation. The ALU performs the
- Arithmetic Operations
- Data Handling Operations
- Logical Functions.

The data to be processed are taken from main storage, stored in the working registers, processed and the results placed back in the main storage.

Control Unit

The Control Unit examines the individual instructions in the users' program one by one, interprets each instruction and causes the various circuits to be activated to perform the functions specified. Some of the functions of the control unit are:

i.   It co-ordinates the various parts of the computer system to form a composite integrated data processing system.
ii. It controls the transfer of data between and within the working stores as required by the program.
iii. It controls input/output. Once the program controller has initiated a read/write operation, the control unit continues to monitor the operation to ensure that it is satisfactorily completed.
iv. In time-sharing or on-line systems, the control unit co-ordinates the several concurrent peripheral operations while data is processed internally within the CPU.

4.3 Peripherals Input & Output Devices
4.3.1 Input Device
Computer Input is the process of transferring data from computer-sensible media into the main storage of the computer. The equipment which converts data been captured on a source documents into machine sensible form is called an *input device*. The following terms are related to inputting data into computer.

- Data Capture is the term used to describe the process of collecting data in machine sensible form at its source.
- Data Collection is the term used to describe the process of recording the data on source document and subsequently converting it into machine sensible form for input to the computer.
- Data Conversion is the process of transforming the data on source documents into machine sensible form before carrying out the input operation.

Type of Input Device
- **Direct Input Devices** allow data to be input into the computer without any need for data conversion. Examples are: keyboard terminals, mouse, trackballs, scanners, joystick, bar-code readers, touch screens, OCR, OMR and MICR equipment.
- **Indirect Input Devices** accept data from source documents and convert it into computer-sensible form for subsequent input into the computer. Examples are: magnetic tape, magnetic disk, compact disk and diskette drives.

Input devices can also be classified as **manual or automated**. Manual input devices include keyboard, mouse, trackball, joystick, bar-code readers, scanners, and touch screens. Automated input

devices include MICR, OCR, OMR, magnetic stripe and smart cards.

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 like:

- 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.
- The navigation keys, such as the arrow keys, allow you to move your position within a document or webpage.

Some modern keyboards come with "hot keys" or buttons that give you quick and one-press access to programs, files, or commands. Other models have volume controls, scroll wheels, zoom wheels, and other gadgets. For details about these features, check the information that came with your keyboard or computer, or go to the manufacturer's website.
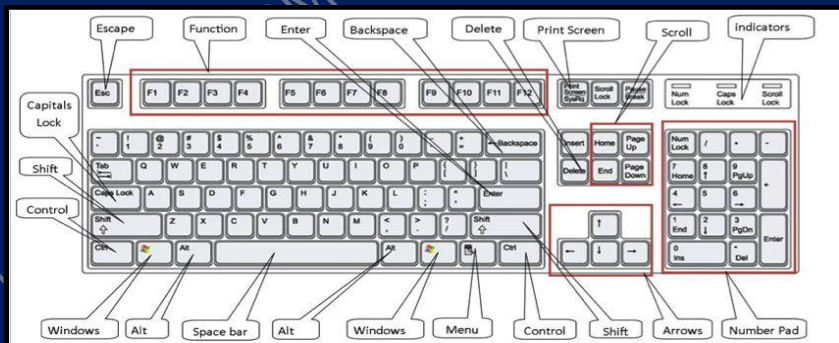

Figure 4c. Modern computer keyboard

Three odd keys

So far, we've discussed almost every key you're likely to use. But for the truly inquisitive, let's explore the three most mysterious keys on the keyboard: PRINT SCREEN, SCROLL LOCK, and PAUSE/BREAK.

Print Screen (or PRT SCN)

A long time ago, this key actually did what it says—it sent the current screen of text to your printer. Nowadays, pressing PRINT SCREEN captures an image of your entire screen (a "screen shot") and copies it to the Clipboard in your computer's memory. From there you can paste it (CTRL+V) into Microsoft Paint or another program and, if you want, print it from that program. More obscure is SYS RQ, which shares the key with PRINT SCREEN on some keyboards. Historically, SYS RQ was designed to be a "system request," but this command is not enabled in Windows.

Scroll Lock (or SCR LK)

In most programs, pressing SCROLL LOCK has no effect. In a few programs, pressing SCROLL LOCK changes the behavior of the arrow keys and the PAGE UP and PAGE DOWN keys; pressing these keys causes the document to scroll without changing the position of the cursor or selection. Your keyboard might have a light indicating whether SCROLL LOCK is on.

Pause/Break

This key is rarely used. In some older programs, pressing this key pauses the program or, in combination with CTRL, stops it from running.

Electronic Mouse

A mouse is a small device used to point to and select items on your computer screen. Although mice come in many shapes, the typical

mouse does look a bit like an actual mouse. It's small, oblong, and connected to the system unit by a long wire that resembles a tail. Some newer mice are wireless. When you move the mouse with your hand, a pointer on your screen moves in the same direction. (The pointer's appearance might change depending on where it's positioned on your screen.) When you want to select an item, you point to the item and then click (press and release) the primary button. Pointing and clicking with your mouse is the main way to interact with your computer.

A mouse typically has two buttons: a primary button (usually the left button) and a secondary button (usually the right button). The primary button is the one you will use most often. Most mice also include a scroll wheel between the buttons to help you scroll through documents and webpages more easily. On some mice, the scroll wheel can be pressed to act as a third button. Advanced mice might have additional buttons that can perform other functions.
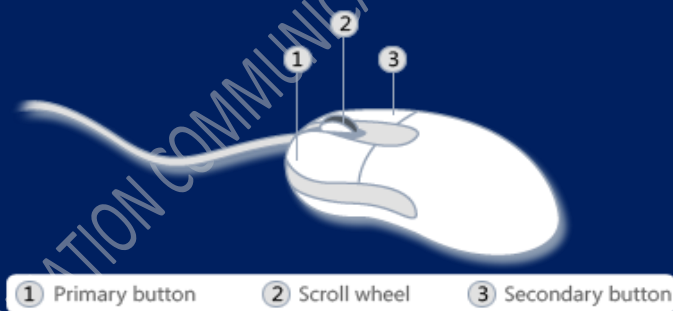

① Primary button   ② Scroll wheel   ③ Secondary button

Figure 4d. Parts of a mouse

Holding and Moving the Mouse
Place your mouse beside your keyboard on a clean, smooth surface, such as a mouse pad. Hold the mouse gently with your index finger resting on the primary button and your thumb resting on the side. To move the mouse, slide it slowly in any direction. Don't twist it; keep

the front of the mouse aimed away from you. As you move the mouse, a pointer on your screen moves in the same direction. If you run out of room to move your mouse on your desk or mouse pad, just pick up the mouse and bring it back closer to you. Hold the mouse lightly, keeping your wrist straight. Figure 4d illustrate the explanation given.

Figure 4d. Mouse holding technique

Pointing, clicking, and dragging: Pointing to an item on the screen means moving your mouse so the pointer appears to be touching the item. When you point to something, a small box often appears that describes the item. For example, when you point to the Recycle Bin on the desktop, a box appears with this information: "Contains the files and folders that you have deleted."

Figure 4e.Pointing to an object to reveals a descriptive message about it

The pointer can change depending on what you're pointing to. For example, when you point to a link in your web browser, the pointer changes from an arrow ▶ to a hand with a pointing finger 👆. Most mouse actions combine pointing with pressing one of the mouse buttons. **There are four basic ways to use your mouse buttons:** clicking, double-clicking, right-clicking, and dragging.

1. Clicking (single-clicking): To click an item, point to the item on the screen, and then press and release the primary button (usually the left button). Clicking is most often used to select (mark) an item or open a menu. This is sometimes called single-clicking or left-clicking.

2. Double-clicking: To double-click an item, point to the item on the screen, and then click twice quickly. If the two clicks are spaced too far apart, they might be interpreted as two individual clicks rather than as one double-click.
   a. Double-clicking is most often used to open items on your desktop. For example, you can start a program or open a folder by double-clicking its icon on the desktop.
3. Right-clicking: To right-click an item, point to the item on the screen, and then press and release the secondary button (usually the right button). Right-clicking an item usually displays a list of things you can do with the item. For example, when you right-click the Recycle Bin on your desktop, Windows displays a menu allowing you to open it, empty it, delete it, or see its properties. If you're ever unsure of what to do with something, right-click it. Right-clicking the Recycle Bin opens a menu of related commands
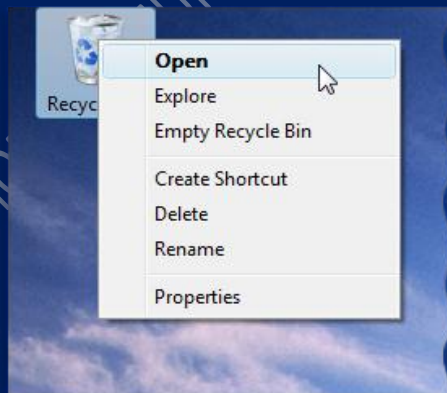

Figure 4f. Right clicking recycle bin

4. Dragging: You can move items around your screen by dragging them. To drag an object, point to the object on the screen, press and hold the primary button, move the object to a new location, and then release the primary button. Dragging (sometimes called dragging and dropping) is most often used to move files and folders to a different location and to move windows and icons around on your screen.

Using the Scroll Wheel
If your mouse has a scroll wheel, you can use it to scroll through documents and webpages. To scroll down, roll the wheel backward (toward you). To scroll up, roll the wheel forward (away from you).

Customizing Your Mouse
You can change your mouse settings to suit your personal preferences. For example, you can change how fast your mouse pointer moves around the screen, or change the pointer's appearance. If you're left-handed, you can switch the primary button to be the right button.

Trackballs
A trackball is like a mouse turned upside down. It is a stationary device related to the mouse. It has a roller ball with only its top exposed outside its case. The cursor on the screen is moved whenever the roller ball is turned. Pressing buttons on the trackball activates various activities represented by the icon selected.

(a) A mouse   (b) A trackball

Touch Screens

Touch screen is a special screen that is able to detect the position on the screen that a user's finger is touching or pointing at. A standard computer screen is covered by two very thin pieces of plastic. Embedded into the plastic is a fine wire and that is linked to the computer. When someone touches the grid, the computer can deduce exactly where the touch is made.

Joysticks

Joysticks are used more on video games than with PCs. A joystick has a short vertical handle that can be tilted forwards and backwards, left and right. A joystick allows the user to point to objects on the screen in the same way as a mouse, but it is more convenient for following a moving target. It may have one or more buttons on it.

Light Pen

A light pen allows the user to point the pen at different parts of a screen to select an option or draw a graphic, so it is like very accurate Touch screens. The use of light pens is quite rare.

Optical Scanners

Optical scanning devices read text or graphics and convert them into digital input for the computer. Thus, optical scanning enables the direct entry of data from source documents into a computer system. Optical scanners employ photoelectric devices to scan the characters being read. Reflected light patterns of the data are converted into electronic impulses that are then accepted as input into the computer system. Optical Character Recognition (OCR) is a form of optical scanning.

Voice Recognition

Voice recognition systems analyse and classify speech or vocal tract patterns and convert them into digital codes for entry into a computer system. Voice recognition systems with large vocabularies require training the computer to recognise your voice in order to achieve a high degree of accuracy

Magnetic Stripe

Swipe and credit cards have black iron oxide coating of magnetic stripe on the reverse side, and it is this that the computer recognises. The black stripe holds information, such as customer account numbers, that can be accessed only by a special magnetic reading device. The reading device converts the information into computer usable form, for example, at the automated teller machines found at banks and at credit card authorization terminals.

Smart Cards

Smart Cards embed a microprocessor chip and several kilobytes of memory into debit, credit, and other cards. Smart debit cards enable the user to store a cash balance on the card and electronically transfer some of it to others to pay for small items and services. The balance on the card can be replenished in automated teller machines (ATMs) or other terminals. Smart cards are widely used to make payments in parking meters, vending machines, pay telephones, and retail stores.

Digital Cameras

Digital still cameras and digital video cameras (digital camcorders) enable the user to shoot, store, and download still photos or full motion video with audio into a PC. Then image-editing software can be used to edit and enhance the digitised images and include them in newsletters, reports, multimedia presentations, and web pages.

Optical Character Readers

Optical character readers (OCR) are machines capable of reading printed documents directly into the computer by recognising the shape of the different characters. Reading of documents prepared in optical characters is accomplished by the use of a scanning device that reflects light from the character on to a lens where it is focused on a photoelectric cell. The cell produces a variable electric current that is unique for each character read. This process is termed optical character recognition.

Optical Mark Readers

Optical mark readers (OMR) are machines that use an artificial light source to scan marks made on OMR documents in order to determine their values. Marking is done in small horizontal shape on documents with black media such as a soft pencil. On OMR documents, predetermined positions are given certain values. The optical reader converts the mark in a position to the appropriate value. This is termed optical mark recognition (OMR).

Magnetic Ink Character Readers

Magnetic ink character readers (MICR) are machines capable of reading magnetic ink characters on MICR documents and passing the data into a computer. A MICR document has human-readable characters printed in the normal way with the use of a specially designed font but using a ferrous-based ink that is capable of magnetization.

Magnetic Ink Character Recognition (MICR) technology is employed by the computer systems of the banking industry to read cheques magnetically.

On-Line Input

This entails data being transmitted directly to the computer by the use of terminals sited at a distance from the computer and linked to

it by communication arrangements. The computers' response is transmitted back to the terminal.

Bar Coding

Bar coding is the representation of code numbers or other data by bars or lines printed or embossed on a data carrier. The data carrier may be a tag, ticket, label, plastic card or a packet/can holding goods.

Universal Product Code

The Universal Product Code (UPC) system was introduced by the USA to cover the complete range of grocery products. Each product is given a unique 10-digit code that is represented in bar code form on every packet or other type of container or on labels. The bars are in pairs, each of which represents a digit according to their spacing and thickness. Certain symbols are also represented including those to indicate the start and finish of the bar coding. The European equivalent of UPC is the European Article Number (EAN).

Bar Code Readers

A bar code reader functions as follows: The bar code is scanned by a laser, which measures the thickness of the lines and the distance between them to decipher the code. Once read, the information can be transmitted to a computer. These hardware devices are often used for point-of-sale input systems in supermarkets and other outlets.

Output Devices

Computer output is the process of transferring data and information from the main storage of the computer onto a human-sensible medium or a machine-sensible medium. The principal methods of producing computer output are:

i.   Displayed output on a VDU screen

ii. Printed output on paper
iii. Computer-sensible output on a magnetic medium
iv. Computer output on microform
 v. Plotters
vi. Sound output

Video Output

Video monitors use cathode ray tubes (CRT) technology similar to the picture tubes used in home TV sets. The clarity of the video display depends on the type of video monitor and the graphic circuit board installed in the computer. The information displayed on the screen is often referred to as soft copy. Monitors can be monochrome or colour. Monochrome monitors give a display of varying intensity on a single colour, for example, white on black background or orange/green on dark background. Colour monitors give a display with a range of colours determined by the colour circuitry in the monitor and the computer.

Printers/ Plotters

A printer is a mechanical device used for producing human-readable information on paper. A printer is connected to a computer for the sole purpose of transferring the information from the computer to paper or other media. The version printed out on paper is often referred to as hard copy. The three main categories of computer printers are line printers, serial/character printers and laser printers. A plotter contains a pen that draws lines on paper. Plotters are devices used for producing hard copies of complex graphics outputs in the form of graphs, charts, histograms and diagrams. These devices are much better than ordinary printers at handling diagrams. The technique has a wide range of use in fields such as scientific research, engineering and management information systems. They are commonly used for such tasks as producing technical drawings and road/rail networks.

Magnetically Encoded Output

Computer output, in coded form, are written onto a magnetic medium usually for the purpose of storing updated records. The magnetic media used for the purpose include diskette, compact disk, magnetic tape, and magnetic disks.

Sound Output

A sound output device reproduces previously recorded and stored sounds. Sound output devices are the output equivalent of sound input devices. Sound output devices simply convey pre-recorded information in audio form. Speech synthesis is the production of sounds resembling human speech by electronic methods. A speech synthesis output device creates speech output from text. Speech synthesis output devices are the flipside of automatic speech recognition input devices. Speech synthesis devices convey information in audio form.

Backing Storage

Backing storage is an extension to a computer's internal storage. It is used for the off-line mass storage of programs, data and files that are not currently being used for processing. The types of common backing storage in use are magnetic tape, magnetic disk, compact disk, USB flash drive and floppy disk.

Magnetic Tapes

The magnetic tape consists of a strip of plastic tape coated with a magnetic material deposited in grains, each of which may be magnetized in one of two directions. A tape is held on a reel. A tape drive is used for writing data onto magnetic tape from the processor and for reading data from magnetic tape into the processor. The reading/writing operations are accomplished by a pair of read/write heads.

Advantages of Magnetic Tape
i.   It is relatively inexpensive, compared to the magnetic disk.
ii.   It has a large data storage capacity.
iii. It is capable of transferring data to and from the main storage of the computer at very high speed.
iv.   Transaction data can be recorded directly onto the magnetic tape by means of magnetic tape encoding machines.
v.   Old data may be erased and the tape used repeatedly.

Disadvantages Of Magnetic Tape
i.   It is only possible to access records serially.
ii.   Data can be accidentally erased or overwritten.
iii. It is not possible to read the records on tape visually.
iv.   Updated information cannot be written back to the same location on the same tape.
v.   Input data must be sorted into the sequence of the master file before updating can start.
vi.   Stringent environment control is necessary in order to eliminate dust and static electricity in the atmosphere.

Magnetic Disks
A magnetic disk or hard disk is a flat circular device, which is similar to a long-playing phonograph record. It is made of metal and each of the recording surfaces is coated with a thin layer of magnetisable iron oxide. Usually, six disks are held on a common axis, one above the other, to form a disk pack. A disk pack is mounted on a disk drive mechanism. The disk drive is used for writing data onto magnetic disk from the processor and reading data from magnetic disk into the processor. The reading/writing operations are accomplished by using a pair of read/write heads placed next to each recording surface.

Advantages of Magnetic Disk
  i.   A pack of disks has very high storage capacity.
  ii.   Data on tracks may be overwritten with new data.
  iii. Disks are ideal for storing subroutines, tables and rates.
  iv.   Disks may be used for real-time remote enquiry systems.
  v.   The speed of data transfer from the processor and to the processor is very high.
  vi.   Data can be input onto a disk without the need for sorting.
  vii. Any item of data can be directly addressed, depending upon the method of the file organisation used.

Disadvantages of Magnetic Disk
  i.   Disk storage devices are more expensive than many other storage media.
  ii.   Data may be accidentally erased or overwritten.
  iii. It is more complex to program disk operations than for magnetic tape.
  iv.   Disk operations involve the locating of overflow records.

USB Flash Drive
A USB flash drive is a data storage device that includes flash memory with an integrated Universal Serial Bus (USB) interface. USB flash drives are typically removable and rewritable, and physically much smaller than an optical disc. Most weigh less than 30 grams (1.1 oz). As of January 2013, drives of up to 512 gigabytes (GB) were available. A one-terabyte (TB) drive was unveiled at the 2013 Consumer Electronics Show and became available later that year. USB flash drives are often used for the same purposes for which floppy disks or CDs were used, i.e., for storage, back-up and transfer of computer files.

Advantages of USB Flash Drive
They are smaller, faster, have thousands of times more capacity, and are more durable and reliable because they have no moving parts

4.4   Review Questions

1. Compare CPU and peripherals
2. Draw a diagram to illustrate the computer hardware configuration
3. Discuss and compare 2 basic components of computer main storage
4. Compare ALU and Control unit of computer CPU
5. Identify any 5 functions of Control unit of CPU
6. Compare direct input and indirect input device
7. Identify and describe 3 most mysterious keys on the keyboard
8. What are the functions of mouse in a graphical users interface
9. Identify any 10 peripherals on a computer system
10. Give 2 examples of peripheral that a computer users can't do without
11. Identify any 5 methods of producing computer output

Chapter Five
Computer Software

5.1   Description Of Computer **Software**

Computer software, or just software, is any set of machine-readable instructions (most often in the form of a computer program) that directs a computer's processor to perform specific operations. Software is a general term. It can refer to all computer instructions in general or to any specific set of computer instructions. It is inclusive of both machine instructions (the binary code that the processor understands) and source code (more human-understandable instructions that must be rendered into machine code by compilers or interpreters before being executed). In most computer platforms, software can be grouped into a few broad categories:
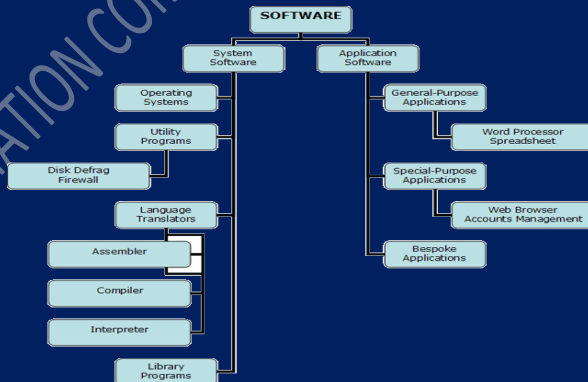
Figure 5a: Organization of Computer Software

5.2 System Software

System software is a group of programs that contribute to the control and performance of the computer system. System software manages and supports the operations of computer systems and networks. They are usually provided by the computer manufacturers. System software is made up of systems management programs and systems development programs.

- **System Management Programs** manage the hardware, software, network, and data resources of the computer system during its execution of the various information-processing jobs of users. Examples are operating systems, network management programs, database management systems, and system utilities.
- **System Development Programs** help users develop information system programs and procedures and prepare user programs for computer processing. Examples are programming language translators and editors.

5.3 Operating Systems

An operating system is a collection of programs which takes over the operation of the computer to the extent of being able to allow a number of programs to be run on the computer without human interventions by an operator. Examples of operating systems on mainframe and minicomputers are IBM-OS/VS, IBM-OS/400 and ICL-VME. On microcomputers, examples include MS-DOS, WINDOWS and LINUX.

Functions of Operating Systems

An operating system (OS) performs five basic functions in the operation of a computer system, namely, providing a user interface, resource management, task management, file management, as well as utilities and support services.

1. **The User Interface:** This is the part of the operating system that allows the user to communicate with it so that the user can load programs, access files, and accomplish other tasks. The main types of user interfaces are

2. **Resource Management:** An operating system uses a variety of resource management programs to manage the hardware and networking resources of a computer system, including its CPU, memory, secondary storage devices, telecommunications processors, and input/output peripherals. For example, memory management programs keep track of where data and programs are stored.

3. **File Management:** An operating system contains file management programs that control the creation, deletion, and access of files of data and programs. File management also involves keeping track of the physical location of files on magnetic disks and other secondary storage devices. So, operating system maintains directories of information about the location and characteristics of files stored on a computer systems secondary storage device.

4. **Task Management:** The task management programs of an operating system manage the accomplishment of the computing tasks of end-users. They give each task a slice of a CPU's time and interrupt the CPU operations to substitute other tasks. Task management may involve a multitasking capability where several computing tasks can occur at the same time. Multitasking may take the form of multiprogramming, where the CPU can process the tasks of several programs at the same time, or timesharing, where the computing tasks of several users can be processed at the same time.

5. **System Utilities:** Utility programs are type of system management software that are marketed as separate programs or are included as part of an operating system. Utilities perform miscellaneous housekeeping and file conversion functions. Examples include data backup, data recovery, virus protection, data compression, and file defragmentation.

5.4   Utilities and Service Programs

These are systems programs that provide facilities for performing common tasks of routine nature. The main types include.

i.   **Sort** is a program used to arrange records into a predetermined sequence by reference to a record key.
ii. **Editors** are used at a terminal and provide facilities for the creation or amendment of programs.
iii. **File Copying** is a program that copies data from one medium to another, for example, from diskettes to hard disk.
iv. **File Renaming** is a program that changes the name of a file to another.
v.   **File Backup** is a program that copies data or file from one medium to another for security purposes.
vi. **Disk Formatting** is a program that prepares a disk or diskette for the purpose of receiving and storing data..
vii. **Dump** is a program that is used to copy the contents of the main storage onto an output medium such as paper.
viii. **File maintenance** is a program that carries out the process of insertion and deletion of records in any file. It can also make amendments to standing data in records.
ix. **Tracing and Debugging** is used in conjunction with the testing of application programs on the computer. Tracing involves dumping to locate errors. Debugging is the process of eliminating errors from a program.

5.5   Programming Languages

A programming language describes the way in which the instructions that make up a computer program are written. The three basic types of programming languages are machine language, assembly language and high-level language.

5.5.1   Machine Languages

A machine language is a programming language composed of numeric instructions. It is made up of strings of binary digits specific to a particular make and model of computer. When programming in machine language, an appropriate set of storage locations must be allocated for both the program and the data before any actual instructions can be written. The interpretation of a machine language program is a direct function of the computer hardware circuitry.

Advantages of Machine Languages

  i.   They are very flexible. They allow programmers to make efficient use of the computer's capabilities.
  ii.   The concepts of machine language programming involve simply transferring data into and out of the accumulator.

Disadvantages of Machine Languages

  i.   Machine language programming is very detailed; therefore, an actual program can be quite complicated.
  ii.   Tedious bookkeeping is involved in writing machine language programs.
  iii. Machine language programs are difficult to correct for errors and difficult to alter.
  iv.   Every computer model has its own machine language; hence machine language programs are machine dependent.

5.5.2   Assembly Language

An assembly language is a programming language made up of operation mnemonics and symbolic data locations. The assembly language programmer makes use of instruction mnemonics and symbolic names of addresses rather than work with operation codes and operand addresses.

Advantages of Assembly Language

i.   The task of learning and writing the language is easier than with machine language.
ii.   Macroinstructions enable one instruction to be translated into several machine language instructions.
iii.   Assembly languages can be used for programming closed subroutines.

Disadvantages of Assembly Language

i.   Assembly languages are more difficult to learn than high-level languages.
ii.   An assembly language program is more difficult to modify than corresponding high-level language program.
iii.   An assembly language is machine dependent.

5.5.3   High-Level Languages

A high-level computer language is a programming language composed of instructions written in English words (for business applications) or in mathematical notations (for scientific applications).The two main purposes of a high-level language are:

i.   To improve the productivity of programmers because high-level languages are relatively easier to learn and a statement written in a high-level language would produce several machine code instructions.

ii. To enable programs to be used on different types of computers without the need to rewrite the programs completely.

Advantages of High-Level Languages
i. Instructions are more like English (for business applications) or more like mathematical notations (for scientific applications), so the languages are easier to learn, easier to write and easier to understand.
ii. They are developed for use on more than one type of computer. That is, they are machine independent.
iii. Programs written in a high-level language are easier to modify and to test.
iv. Programmers trained in the use of a high-level language do not need to learn an entirely new language to work on a new computer.
v. Programs can be written by persons not possessing a detailed knowledge of computers because high-level languages are problem-oriented.

Disadvantages of High-Level Languages
i. The fact that high-level languages can be used for different makes of computers does not allow them to take advantage of specific facilities on individual computers.
ii. Programs written in high-level languages are unlikely to be as efficient, in terms of processing speed and the use of internal storage space, as programs written in machine language or in assembly language.

5.6   Translators

A translator is a systems program that converts statements written in one programming language into statements in the computer language. The statements in a programming language are called

source program. The statements in the computer language are called **object program**. The three types of translators are Assemblers, Compilers and Interpreters.

5.6.1 Assembler

An assembler (or a symbolic assembly program) is a program specially developed by the computer manufacturer to assist the programmer in the preparation of machine-code programs from programs written in symbolic language.

5.6.2 Compiler

A compiler is a program specially written by the computer manufacturer for the purpose of translating a program written in high level language into machine language.

5.6.3 Interpreter

The interpreter is used to translate high-level language programs. It deals with the source program one instruction at a time, completely translating and executing each instruction before it goes on to the next.

The advantage of the Interpreter over a compiler is that it is suitable for interactive work, where the programmer wishes to modify or test the program on-line as it is being developed.

5.7 Applications Software & Application Programs

Applications software is a group of programs that are developed to solve particular problems. They directly provide the processing that users want to have performed. They may be produced by the computer manufacturer or supplier, a software house, or the computer user. They are of two types, application programs and application packages.

- **Application programs** are mostly written by the users to carry out a task, e.g. payroll programs; hence they are also called user programs or tailor-made programs.

- **Application packages** are ready-made generalised programs with associated documentations for solving business and other problems.

Advantages of Application Software
i.   The user gets a well-tried and tested program.
ii. Implementation is quicker and possibly cheaper.
iii. Systems design, programming and systems testing are minimised.
iv. Systems documentation is provided with the packages.
v.   Efficiency in terms of speed, storage requirements and accuracy.
vi. Portability from the existing computer system to another.

Disadvantages of Application Packages
i.   It may be inefficient due to the inclusion of irrelevant features.
ii. It might be used even when it is not completely suitable to the particular application.
iii. The user is dependent on the supplier for the maintenance of the package.
iv. No immediate help on site when a serious problem occurs.
v.   May not be updated in line with legislation, e.g. VAT rates.

5.8   Application Software Selection
There are various considerations before one select application software for his or her business organization or individual personal uses. Some of the considerations are described as follows.

i.   **Comprehensiveness.** The package must satisfy user's requirements.
ii. **Cost**. It should be affordable to the user.

iii. **Reliability.** The package should have been used by other organisations for some time with considerable degree of success.
iv. **Flexibility**. It should be fairly easy to be amended, modified and upgraded.
v. **Portability.** The package should be suitable for use with any computer system acquired in the future by the user.
vi. **Interfacing.** The package should link up conveniently with existing systems and routines.
vii. **Peripherals.** The input and output hardware devices required by the package should be compatible with the user's existing devices.
viii. **Storage**. The package should be able to be accommodated within the main storage and backing storage existing on the user's system.
ix. **Documentation**. It must be well documented. The procedures for input, processing and output should be clearly documented.
x. **Timing**. The time required to process a particular application, such as payroll, should be compared on a number of similar packages.

5.9 Software Suites

A software suite consists of most widely used productivity packages bundled together. Examples are Microsoft Office, Lotus Smart Suite and Corel Word Perfect Office. Each suite typically integrates software packages for word processing, spreadsheets, presentation graphics, database management and personal information management. Each suite may contain other programs such as programs for Internet access and web publishing.

Advantages of Software Suite
i.   It costs a lot less than the total cost of buying its individual packages separately.
ii. All programs use a similar graphical user interface (GUI) of icons, tool and status bars, menus, and so on, which gives them the same look and feel, and makes them easier to learn and use.
iii. All programs share common tools such as spell checkers and help wizards to increase their efficiency.
iv. The programs are designed to work together seamlessly, and import each other's files easily, no matter which program is in use at the time. This makes them more efficient and easier to use than using a variety of individual package versions.

Disadvantages of Software Suite
i.   Many software suite features are never used by most end users.
ii. The suite takes up a lot of disk space.

5.10   Review Questions
1. Describe computer software and draw a diagram to illustrate the classification of computer software
2. Compare application software and system software
3. Describe the classification system software
4. Discuss any 5 functions of operating system in a computer
5. Of which class is utility program. Hence identify any 5 utilities program and their function
6. Why program translators
7. Describe 3 major program translator you know
8. There are 3 major programing languages identify them and give 2 advantages and 2 disadvantages of each.
9. Discuss any 5 of various consideration before one select application software for usage

10. Why software suite? Hence give 3 advantages and 3 disadvantages of software suite

Chapter Six
Computer Operation

7.1 Computer Users

User is an agent, either a human agent (end-user) or software agent, who uses a computer or network service. Users are also widely characterized as the class of people that use a system without complete technical expertise required to understand the system fully. Computer users can be classified into the following categories based on the way they think about computers.

Application-oriented Users

The vast majority of computer users are application-oriented. They have training and experience exclusively with commercial software. They understand concepts peculiar to computers such as files, folders, saving, and deleting. They live in a WYSIWYG world; although they may be aware that what they see on the screen is not an entirely accurate representation of what the computer is actually doing, they are not interested in understanding hidden implementations. They have learned how to map their thinking onto the capabilities of the applications they regularly use, and they accept whatever limitations that thinking may impose. They are pragmatic, learning as much as they need to get their work done. A new problem requires a new piece of software. Spreadsheet "programmers" fall into this category, as may some programmers who work primarily with application scripting tools such as Microsoft Visual Basic for Applications. Nearly all commercial

software is targeted at this group of users, who can be considered "computer-literate."

Goal-oriented users

The second largest group consists of goal-oriented users. These users focus exclusively on the goals they want to accomplish and neither understands nor cares about the software they use to accomplish those goals. This could be called the "I just want to type a letter" group. They only see the final product. They do not care about, for example, the difference between a word processor document and a PDF image of that same document, so they do not understand why they can make textual edits to one and not the other. They could be described as "computer-illiterate," even if they work with computers on a regular basis. Many very intelligent people, scientists and scholars, fall into this category. They are frustrated by the limitations of the software they use because they do not understand the reasons for those limitations. Though they may use common terms such as "files," they typically map those concepts onto their real-world metaphorical analogues, resulting in confusion. ("Why can't I keep this picture in my email file?")

Original Computer Users

The third and smallest group of computer users ironically, the original computer users is comprised of hackers. Hackers are computer-oriented computer users. They have learned how to think like a computer, to understand the processes the computer goes through. They favor small tools (e.g. the command line, shell scripts) over large applications because they want to be in precise control of what the computer is doing at all times. They comfortably work with data in "raw" formats such as text files. This does not necessarily mean they are tied down with minutiae of implementation; often they can work at much higher levels of abstraction than other users. Hackers tend to seek out the abstract

patterns inherent in whatever end result they are working towards, then implement those patterns in the computer. A new problem rarely requires new tools, merely a new application of existing tools. They will create whatever new tools are needed to bring the computer up to the level of the problem, rather than trying to adapt the problem to fit the computer. On the other hand, their solutions tend to be brittle, with a lot of exposed complexity that makes them unsuitable for non-hacker users.

7.2   System Booting

When we start our Computer, there is an operation which is performed automatically by the Computer which is also called as Booting. In the Booting, System will check all the hardware's and Software's those are installed or Attached with the System and this will also load all the Files those are needed for running a system. In the Booting Process all the Files those are Stored into the ROM Chip will also be Loaded for Running the System. In the Booting Process the System will read all the information from the Files those are Stored into the ROM Chip and the ROM chip will read all the instructions those are Stored into these Files. After the Booting of the System this will automatically display all the information on the System. The Instructions those are necessary to Start the System will be read at the Time of Booting. There are two Types of Booting.

i.   **Cold Booting:** when the System Starts from the Starting or from initial State Means when we Starts our System this is called a cold Booting. In the cold Booting the System will be started from its beginning State means first of all, the user will press the Power Button, then this will read all the instructions from the ROM and the Operating System will be automatically gets loaded into the System RAM.

ii. **Warm Booting:** The warm Booting is that in which System Automatically Starts when we are Running the System, For Example due to Light Fluctuation the system will Automatically Restarts So that in this Chances Damaging of system are more, and the System will not be start from its initial State So May Some Files will be Damaged because they are not Properly Stored into the System.

7.3 Occupational Health and Safety
7.3.1 Basic Description of Occupational health and safety
Occupational health and safety is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational health and safety programs is to foster a safe work environment. As a secondary effect, it may also protect co-workers, family members, employers, customers, suppliers, nearby communities, and other members of the public who are impacted by the workplace environment. It may involve interactions among many subject areas, including occupational medicine, occupational (or industrial) hygiene, public health, safety engineering, chemistry, health physics. Occupational health should aim at:

i. The promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations;
ii. The prevention amongst workers of departures from health caused by their working conditions;
iii. The protection of workers in their employment from risks resulting from factors adverse to health;
iv. The placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities;

These regulations are concerned with the working environment. They place a duty on employers to make sure that the workplace is

safe and suitable for the tasks being carried out there, and that it does not present risks to employees and others.

7.3.2   Regulation For Maintaining Health and Safety

The regulations for maintaining health & safety in the working environment, includes:

i.   maintenance of the workplace, equipment, devices and systems
ii.   ventilation
iii.   temperature in indoor workplaces
iv.   lighting
v.   cleanliness and waste materials
vi.   room dimensions and space
vii.   work stations and seating
viii.   condition of floors and traffic routes
ix.   falls or falling objects
x.   windows and transparent or translucent doors, gates and walls
xi.   windows, skylights and ventilators
xii.   ability to clean windows, etc. safely
xiii.   doors and gates
xiv.   escalators and moving walkways
xv.   sanitary conveniences
xvi.   washing facilities
xvii.   drinking water
xviii.   accommodation for clothing
xix.   facilities for changing clothing
xx.   Facilities for rest and to eat meals.

7.3.3   Why Occupational Health and Safety

Some reason for occupation health and safety are;

i.   Occupational health and safety promote health and safety procedures in organizations.

ii.   Help to recognize hazards and measure health and safety risks, set suitable safety controls in place, and give recommendations on avoiding accidents to management and employees in an organizations.

iii.   An effective training program can reduce the number of injuries and deaths, property damage, legal liability, illnesses, workers' compensation claims, and missed time from work.

iv.   Safety training classes help establish a safety culture in which employees themselves help promote proper safety procedures while on the job. It is important that new employees be properly trained and embraces the importance of workplace safety as it is easy for seasoned workers to negatively influence the new hires.

7.3.4   Safety and Health Hazards

The terminology used in OSH varies but generally speaking a hazard is something that can cause harm if not controlled. The outcome is the harm that results from an uncontrolled hazard. A risk is a combination of the probability that a particular outcome will occur and the severity of the harm involved. "**Hazard**", "**risk**", and "**outcome**" are used in other fields to describe e.g. environmental damage, or damage to equipment. However, in the context of OSH, "harm" generally describes the direct or indirect degradation, temporary or permanent, of the physical, mental, or social well-being of workers. For example, repetitively carrying out manual handling of heavy objects is a hazard. The outcome could be a musculoskeletal disorder (MSD) or an acute back or joint injury.

7.3.5   Nigerian Occupational Health and Safety Bill

The Bill to enact a law that would take care of the health and safety of industrial workers passed through second reading on the floor of the Senate on 25th February, 2009. The bill sponsored by Senator

Chris Anyanwu which was committed to the senate committees on Labor, Health seeks amongst other things to ensure that employers of labor are properly protected.

Highlights of Nigerian Occupational Health and Safety Bill

i. To make further provisions for securing the safety, health and welfare of persons at work

ii. To make provisions for protecting others against risks to safety or health in connection with the activities of persons at work

iii. To establish the National Council for Occupational Safety and Health to create a general framework for the improvement of working conditions and the working environment

iv. To prevent accidents and departures from health arising out of or in the course of work

v. To ensure the provision of occupational safety and health services to workers in all sectors of economic activity

vi. The bill is also to establish the National Council for Occupational Safety and Health Hazards and for related issues with the following functions

vii. To ensure employee safety and health in Nigeria by working with employers and employees to create better working environments

viii. To act as a regulatory agency by issuing safety and health standards that is enforceable under Nigerian safety law.

7.4   Computer Health and Safety
7.4.1   Description Of Computer Health And Safety
The number of computers in the workplace has increased rapidly over the last few years and it is now quite normal for most staff in organizations to be exposed to computer usage. The Health and Safety at Work Act lays down legal standards for computer

equipment and requires employers to take steps to minimize risks for all workers. Improving health and safety practice should be taken seriously, although it need not take much time or expense. Measures employers should take include:

i. Understanding the law - make sure someone in your organization has a health and safety brief covering all areas, not just computers.
ii. Being aware of the health risks - the government officially recognizes some of the risks although there are some grey areas you'll need to make up your own mind about.
iii. Assessing the risks - using procedures set out in the law - be systematic and get help if you need it. Get a health and safety audit done by a competent organization if necessary.
iv. Taking steps to minimize the risks - this may only involve taking simple measures.
v. Training all users to recognize the risks - if people aren't aware of the dangers they can't take adequate precautions to protect their health.
vi. Taking users views seriously - if users feel there is something wrong there often is.

7.4.2   Risks within Computer Environment
The main risks associated with using computers include:
i. Musculoskeletal problems
ii. Eye strain
Hint' Rashes and other skin complaints have also been reported, although it is thought these are caused by the dry atmosphere and static electricity associated with display units rather than by the display units themselves.

Musculoskeletal problems

These can range from general aches and pains to more serious problems which include
  i.   Upper limb disorders such as repetitive strain injury (RSI) and carpal tunnel syndrome - by far the most important as it can quickly lead to permanent incapacity
  ii.   Back and neck pain and discomfort
  iii. Tension stress headaches and related ailments

Causes of Musculoskeletal Problems
  i.   Maintaining an unnatural or unhealthy posture while using the computer
  ii.   Inadequate lower back support
  iii. Sitting in the same position for an extended period of time
  iv.   An ergonomically poor workstation set up

Eye Strain

Computer users can experience a number of symptoms related to vision as follow:
  i.   Visual fatigue
  ii.   Blurred or double vision
  iii. Burning and watering eyes
  iv.   Headaches and frequent changes in prescription glasses

Computer work hasn't been proven to cause permanent eye damage, but the temporary discomfort that may occur can reduce productivity, cause lost work time and reduce job satisfaction.

Causes of Eye Strain
  i.   Eye problems are usually the result of visual fatigue
  ii.   Glare from bright windows or strong light sources
  iii. Light reflecting off the display screen
  iv.   Poor display screen contrast

7.4.3   Precaution to Prevent Risk Associated With Computer

Musculoskeletal Problems: General precautions to avoid musculoskeletal problems include:

   i.   Taking regular breaks from working at your computer - a few minutes at least once an hour
   ii.   Alternating work tasks
   iii. Regular stretching to relax your body
   iv.   Using equipment such as footrests, wrist rests and document holders if you need to
   v.   Keeping your mouse and keyboard at the same level
   vi.   Avoiding gripping your mouse too tightly - hold the mouse lightly and click gently
   vii. Familiarize yourself with keyboard shortcuts for applications you regularly use (to avoid overusing the mouse)
   viii. It is also important to have your workstation set up correctly. Your workstation includes monitor, keyboard, mouse, seating, desk, and where appropriate, footrest (to enable you to put your feet flat if they would otherwise not reach the floor), wrist rest, and document holder.

Monitors should

   i.   Swivel, tilt and elevate - if not use an adjustable stand, books or blocks adjust the height
   ii. Be positioned so the top line of the monitor is no higher than your eyes or no lower than 20° below the horizon of your eyes or field of vision
   iii. Be at the same level and beside the document holder if you use one
   iv. Be between 18 to 24 inches away from your face

Keyboards should

i. Be detachable and adjustable (with legs to adjust angle)
ii. Allow your forearms to be parallel to the floor without raising your elbows
iii. Allow your wrists to be in line with your forearms so your wrists does not need to be flexed up or down
iv. Include enough space to rest your wrists or should include a padded detachable wrist rest (or you can use a separate gel wrist rest which should be at least 50 mm deep)
v. Be placed directly in front of the monitor and at the same height as the mouse, track ball or touch pad

Chairs should

i. Support the back - and have a vertically adjustable independent back rest that returns to its original position and has tilt adjustment to support the lower back
ii. Allow chair height to be adjusted from a sitting position
iii. Be adjusted so the back crease of the knee is slightly higher than the pan of the chair (use a suitable footrest where necessary)
iv. Be supported by a five prong caster base
v. Have removable and adjustable armrests
vi. Have a contoured seat with breathable fabric and rounded edges to distribute the weight and should be adjustable to allow the seat pan to tilt forward or back

Tables and desks should

i. Provide sufficient leg room and preferably be height adjustable
ii. Have enough room to support the computer equipment and space for documents
iii. Be at least 900 mm deep
iv. Have rounded corners and edges

Avoiding Eyestrain

Precautions that can be taken to avoid eyestrain include:

i. Exercising the eyes by periodically focusing on objects at varying distances

ii. Blinking regularly

iii. Keeping the air around you moist - for example using plants, open pans of water or a humidifier (spider plants are said to be particularly good for this and removing chemical vapors from the air)

iv. Adjusting the screen height / seating so that when sitting comfortably your eyes are in line with the top of the monitor screen

v. Adjusting the brightness control on your monitor for comfort

vi. Adjusting the contrast on your monitor to make the characters distinct from the background

vii. Adjusting the refresh rate of your monitor to stop it flickering

viii. Positioning monitors to avoid glare (e.g. not directly in front of windows)

ix. Keeping your monitor the screen clean

x. Keeping the screen and document holder (if you use one) at the same distance from your eyes

xi. Servicing, repairing or replacing monitors that flicker or have inadequate clarity

xii. Regular eye testing - do this at least once every 2 years and more frequently if necessary - especially if you are experiencing eye problems related to using display equipment. Indicate the distance from your eyes to the monitor to your optician and talk to them regarding special lenses or the use of bifocals.

7.5   Review Questions

1. Who are the computer users?

2. Discuss computer users based on the way they think about computers.
3. What do you understand by system booting? Hence identify and explain briefly 2 types of system booting
4. Describe briefly occupation health and safety
5. What are the basic aim of occupational health and safety?
6. Identify any 5 regulation for maintain health and safety in the working environments
7. Give the highlights of Nigeria occupational health and safety bill
8. What are the Measures that employers should take to reduce or minimize occupational health hazard in a business organizations?
9. Identify and discuss 2 major risks associated with computer usage
10. Identify any 5 general precautions to minimize each of the risk mentioned.
11. What is the relation between computer ergonomic and computer health hazard?

Chapter Seven
Data Processing Techniques

7.1   Definition of Data Processing

Data processing is be defined as the methods and procedures of converting data into information. That is, the manipulation of data, its retention and subsequent retrieval. Data processing is the activities involved in the transformation of data into information.

7.2   Methods of Data Processing
Various methods of data processing are discussed below:

Manual method: This involves the use of pen, pencil, paper, desk calculator/adding machine and human brain. This mode of data processing is suitable in a business environment where volume of data to be processed is small and delivery time is not critical.

Advantages	Disadvantages
1. Easy to operate and understand.	1. It involves much paper work.
2. Low initial set-up cost.	2. Delay in production of results.
3. Creates job opportunity.	3. Cannot handle large volume of data.
	4. It is tiresome.
	5. Prone to error.

Mechanical (or electro-mechanical) method: This involves the use involves the use of machines that are activated by an operator e.g. punch cards equipment, Abacus, accounting machine etc. This method is faster than the manual method of processing data. The rate of error is less than the error rate in manual mode.

Advantages	Disadvantages

1. Easy to operate and understand.	1. Required skilled personnel.
2. Faster than manual method.	2. Susceptible to human error.
3. Reduced error rate compared to manual method.	3. Susceptible to mechanical faults.

Electronic Data Processing Method: This involves the use of computer to process data. EDP has the highest processing speed among all the three modes of data processing. Input devices are used to feed data into the computer; microprocessors are used to process the data and output devices are used to pass the result of processing (i.e. output or information) to the user.

Advantages	**Disadvantages**
1. It produces accurate results.	1. High initial set-up cost.
2. It is very fast.	
3. It improves efficiency.	2. Requires regular power supply.
4. It handles complex computation.	
5. It has large storage facility.	3. Required skilled personnel.
6. Handles large volume of data in short time.	4. Data is susceptible to virus attack.
	5. Cost of maintenance may be high.

7.3 Data Processing Stages

Stages of data processing include: origination, input, processing, storage, output and distribution. The data processing cycle is depicted in the following diagram.
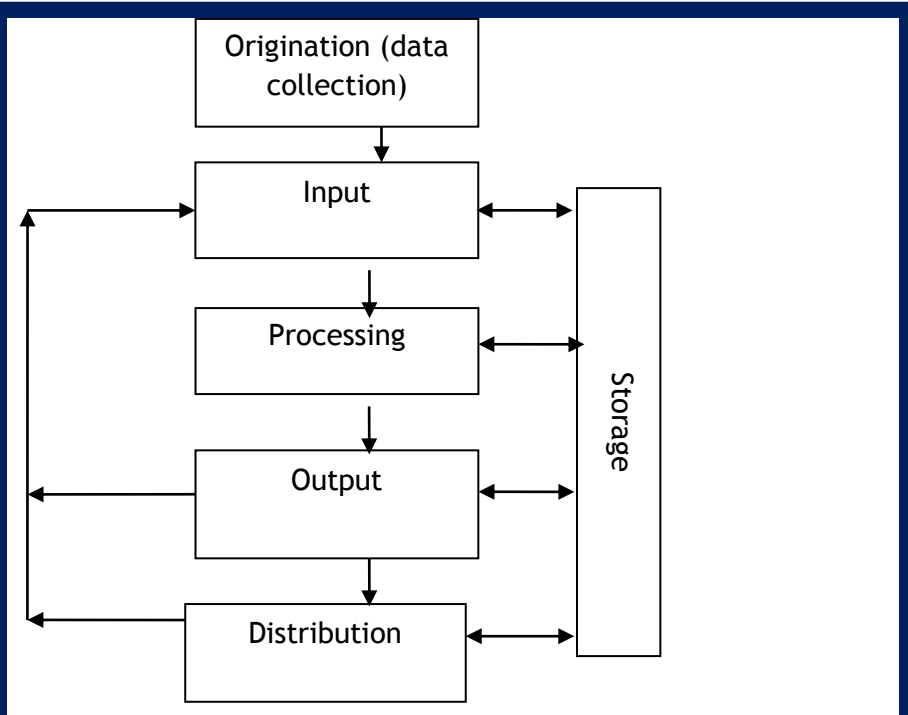
Figure 7a.   Data Processing stages

i)   Origination: This is the collection of original (primary) data. It is possible to collect data and store it away in a secondary storage medium pending the time the data would be required for processing.

ii)   Input: This means feeding the data into the computer. Data is prepared in a convenient/suitable form for processing. The form of input device used depends on the data processing method. e.g. punch cards are used in electromechanical data processing while magnetic tape, disk, keyboard (terminal) are used in electronic data processing.

iii) Processing: This is a planned series of actions and operations performed on data to convert the data to a more meaningful form called information.

iv)   Storage: storage of data/Information could take place at any stage for future purposes. The double-headed arrows show the storage of data/information at one time, and the stored data/information serving as input for processing at another time.

v)   Output: This is the result of the processed data (information). At times, the information produced today could be distributed to the appropriate end-users; at some other times, the information could be used as input for another data processing cycle.

vi)   Distribution: This is the dissemination of information produced, to the appropriate quarters for decision-making. The decision-makers are the end-users of information.

7.4   Data Processing Techniques

Various Data processing techniques available are discussed as follows.

i.   **Batch Processing**: This is a processing technique whereby many individual jobs/transactions are collected together (i.e. batched) and periodically processed against a master file using a single program loading. For instance, before the advent of online banking, many banks adopted batch processing where records of customer deposits made throughout the day are collected and batched for processing in the night (nightly processing) against the master file of account balances. However, if batch processing is used to process withdrawals, criminals would not have to use guns to rob banks! Batch processing is also applicable in payroll system which processes the different employee's payslip individually in a single continuous operation. It is also applicable in billing system.

ii.   **Online-Processing**: On-line processing: is the technique of using computer to process data by means of terminals connected to and controlled by a central processor. On-line systems involve the receipt of data directly from the point of origin through a variety of input/output terminal devices with telecommunication capabilities. On-line processing provides direct access to information files by terminal users and also enables them to update files with transaction data.

iii.   **Time Sharing**: Time-sharing: This processing technique allocates several small equal time slices to terminal users as their jobs are being processed. For instance, the computer might allocate 100 milliseconds (ms) to user 1, then 100ms to user 2, and then 100ms to user 3 and so on. If there are 100 users on the computer, it will allocate 100ms to each user before it returns to the top of the job queue and gives each user another round of 100ms. By so doing, the computer is able to work so quickly that each user feels as if he/she has exclusive use of the computer system. As new user jobs are presented to the computer or are finished, they are respectively added to or deleted from the job queue.

iv.   **Real-Time processing**: Real-time processing: is an on-line technique which is able to receive input data from various sources and which is able to process that data sufficiently rapidly to be capable of influencing the sources of the data.

v.   **Distributed vs. Centralized Processing**: A combination of local and remote computer terminals in a network connected to a central computer to divide the workload. A Distributed data processing facility is one in which computers, usually smaller computers, are dispersed throughout the organization. The objective of such disperse is to process

information in a way that is most effective based on operational. Centralized data processing is a Computer data processing architecture where data processing support is provided by one or a cluster of computers, generally a large. Dedicated computers, located in a central data processing facility. In a centralized architecture, each person is provided with a local terminal that is connected by a communications facility to the central data processing facility.

7.5   Review Question
1. Describe briefly the term data processing
2. Compare manual and computer-based data processing
3. What are the advantages and disadvantages of manual data processing
4. What are the factors that facilitate computer-based data processing
5. Discuss the stages of data processing. Hence draw a diagram to illustrate your discussion
6. Write briefly on the following data processing techniques
a. Batch Processing
b. Online-Processing
c. Time Sharing
d. Real-Time processing
e. Distributed vs. Centralized Processing

Chapter Eight
Computer Data Management

8.1 Description Of Data

Data is/are collection of raw fact(s) about people, objects, events and concepts. Data can be used either in the singular or plural sense. Information is the data that is analyzed/processed in a meaningful manner, for decision making. That is, we obtain information when a set of data undergoes processing. The terms **Data**, Information and Knowledge are frequently used for overlapping concepts. The main difference is in the level of abstraction being considered. Data is the lowest level of abstraction, information is the next level, and finally, knowledge is the highest level among all three.

Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized. E.g. each student's test score is one piece of data. Data is an abstract concept that can be viewed as the lowest level of abstraction from which information and then knowledge are derived. Data in themselves are fairly useless. But when these data are interpreted and processed to determine its true meaning, they become useful and can be called Information. Data is/are the **facts of the World.** For example, take yourself. You may be 6ft tall, have black hair and yellow eyes. All of this is "data". You have black hair whether this is written down somewhere or not.

Data can be thought of as a **description of the World.** We can perceive this data with our senses, and then the brain can process

this. Human beings have used data as long as we've existed to form knowledge of the world. Until we started using information, all we could use was data directly. If you wanted to know how tall I was, you would have to come and look at me. Our knowledge was limited by our direct experiences. Information allows us to expand our knowledge beyond the range of our senses. We can **capture data in information**, and then move it about so that other people can access it at different times. Information is a critical resource in the operation and management of organizations. Timely availability of relevant information is vital for effective performance of managerial functions such as planning, organizing, leading, and control.

Data in Real World
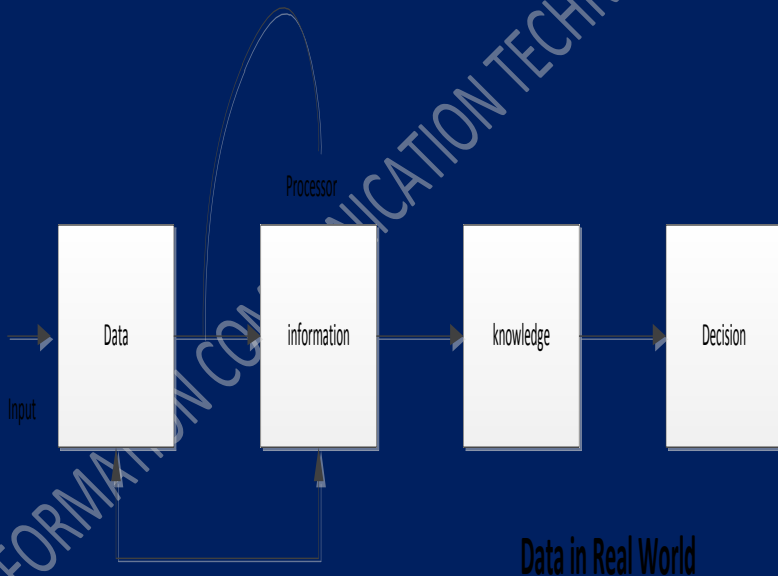
The diagram could be explained further as follows;

i. **Data** → processing → **Information**
ii. **Information** → intelligence → **Knowledge**
iii. **Knowledge** → experience → **Wisdom**

Attributes of Data/Information
1. **Usability**
    i. Relevant: Relevance is yet another key attribute of management information. Information is said to be relevant if it answers specifically for the recipient what, why, where, who and why? In other words, the MIS should serve reports to managers, which are useful, and the information helps them make decisions.
    ii. Simple: good information should not be too voluminous; it should contain only the relevant facts, without leaving out any necessary details.
    iii. Flexible: Data should able to adapt to new situation: able to change or be changed according to circumstances.
    iv. Economical/cost-effective: Cost-effective: the value to be derived from the use of good information should surpass the cost of obtaining such information.
    v. Exception based: Top managers need only exception reports regarding the performance of the organization. Exception reporting principle states that only those items of information, which will be of particular interest to a manager, are reported. This approach results in saving precious time of the top management and enables the managers to devote more time in pursuit of alternatives for the growth of the organization.
    vi. Explicitness: A report is said to be of good quality if it does not require further analysis by the recipient for decision-making. Thus the reports should be such that a manager does not waste any time on the processing of the report, rather he should be able to extract the required information directly.
2. **Quality**
    i. Accurate: Accuracy is another key-attribute of management information. It means that information is free

from mistakes and errors, is clear and accurately reflects the meaning of data on which it is based. It conveys an accurate picture to the recipient, who may require a presentation in graphical form rather than tabular form.

ii. Verifiable: There must be means to check whether the data is true either by examination, investigation, or comparison.

iii. Complete: The information, which is provided to a manager, must be complete and should meet all his needs. Incomplete information may result in wrong decisions and thus may prove costly to the organization.

iv. Adequate: Adequacy means information must be sufficient in quantity. MIS must provide reports containing information, which is required in deciding processes of decision-making.

v.   Reliable: content of good information should be such that the user can rely upon. Relevance: good information should be relevant to the subject it is required for.

3. Delivery

i.   Timely: Timeliness means that information must reach the recipients within the prescribed time frame. Timeliness refers to the currency of the information presented to the users. Currency of data or information is the time gap between the occurrences of an event in the field until its presentation to the user (decision maker). Timely information can ensure correct executive action at an early stage. The characteristic of timeliness, to be effective, should also include current information.

ii. Accessible: Data must be easily reached i.e. easy to enter or reach physically, easily understood without specialist knowledge, and easily available to be obtained, used, or experienced without difficulty.

8.2   Methods Of Data Collection/Gathering

Data collection is a term used to describe a process of preparing and collecting data - for example as part of a process improvement or similar project. The purpose of data collection is to obtain information to keep on record, to make decisions about important issues, to pass information on to others. Some methods of data gathering are:

i.   Interview
ii.   Questionnaire
iii.   Observation of the system in operation
iv.   Measuring,
v.   User workgroup
vi.   Background research
vii.   Special purpose survey. Etc.

8.3   Methods Of Data Validation

In computer science, data validation is the process of ensuring that a program operates on clean, correct and useful data. It uses routines, often called "validation rules" or "check routines", that check for correctness, meaningfulness, and security of data that are input to the system. Data validation checks that data are valid, sensible, reasonable, and secure before they are processed.

Validation methods: There are several means by which data can be validated; the most popular validation methods are discussed as follows:

i.   Format or picture check: Checks that the data is in a specified format (template), e.g., dates have to be in the format DD/MM/YYYY.

ii.   Data type checks: Checks the data type of the input and give an error message if the input data does not match with the chosen data type, e.g., In an input box accepting numeric data, if the

letter 'O' was typed instead of the number zero, an error message would appear.

iii. Range check: Checks that the data lie within a specified range of values, e.g., the month of a person's date of birth should lie between 1 and 12.

iv. Limit check: Unlike range checks, data is checked for one limit only, upper OR lower, e.g., data should not be greater than 2 (>2). Presence check: Checks that important data are actually present and have not been missed out, e.g., customers may be required to have their telephone numbers listed.

v. Check digits: Used for numerical data. An extra digit is added to a number which is calculated from the digits. The computer checks this calculation when data are entered, e.g., The ISBN for a book. The last digit is a check digit calculated using a modulus 11 method.

vi. Batch totals: Checks for missing records. Numerical fields may be added together for all records in a batch. The batch total is entered and the computer checks that the total is correct, e.g., add the 'Total Cost' field of a number of transactions together.

8.4   Methods Of Data Storage

The methods of data storage are discussed based on the media usage as follows:

i. Magnetic: Magnetic storage uses different patterns of magnetization on a magnetically coated surface to store information. Magnetic storage is non-volatile. The information is accessed using one or more read/write heads which may contain one or more recording transducers.

ii. Optical: Optical storage, the typical Optical disc, stores information in deformities on the surface of a circular disc and reads this information by illuminating the surface with a laser diode and observing the reflection. Optical disc storage is non-volatile. The deformities may be permanent (read only media),

formed once (write once media) or reversible (recordable or read/write media). The following forms are currently in common use: CD, CD-ROM, DVD, BD-ROM: Read only storage, used for mass distribution of digital information (music, video, computer programs)

iii. Magneto-optical disc storage: Magneto-optical disc storage is optical disc storage where the magnetic state on a ferromagnetic surface stores information. The information is read optically and written by combining magnetic and optical methods. Magneto-optical disc storage is non-volatile, sequential access, slow write, fast read storage used for tertiary and off-line storage.

iv. **Paper:** Paper data storage, typically in the form of paper tape or punched cards, has long been used to store information for automatic processing, particularly before general-purpose computers existed. Information was recorded by punching holes into the paper or cardboard medium and was read mechanically (or later optically) to determine whether a particular location on the medium was solid or contained a hole.

v. **Optical tape**: This is a medium for optical storage generally consisting of a long and narrow strip of plastic onto which patterns can be written and from which the patterns can be read back. It shares some technologies with cinema film stock and optical discs, but is compatible with neither. The motivation behind developing this technology was the possibility of far greater storage capacities than either magnetic tape or optical discs.

8.5 Data Protection Against Viruses & Attacks

Data protection against viruses and attack is very important in the computer environment. Means of preventing data against Virus & attacks are:

i.   Installation of anti-Virus software on a computer system
ii.   Running of secure operating system
iii.   Scanning of system regularly for virus
iv.   Avoid programs from unknown source
v.   Backup data regularly
vi.   Limit the sharing of data storage devices such as: flash drive, CDs, external hard drive etc
vii.   Restricted access
viii.   Put computer in a save location
ix.   Prevent computer against power fluctuation and surge
x.   Segregation of duties
xi.   Hire carefully
xii.   Frequent audits
xiii.   Monitoring transaction
xiv.   Encryption

8.6 Review Questions

1. Data is information, information is data. Juxtapose
2. Draw a diagram to illustrate the relationship between data, information knowledge and decision
3. Discuss the attributes of data based on usability, quality, and delivery.
4. Identify and 5 means of data gathering
5. What is a data validation method? Hence describe any 5 means by which data can be validated
6. Describes means of computer data storage
7. Identify any 5 means of protecting data against virus

Chapter Nine
Data Communication & Computer Network

9.1   Description Of Data Communication and Transmission

Data Communications is the transfer of data or information between a source and a receiver. The source transmits the data and the receiver receives it. The actual generation of the information is not part of Data Communications nor is the resulting action of the information at the receiver.   Data Communication is interested in the transfer of data, the method of transfer and the preservation of the data during the transfer process.
In Local Area Networks, we are interested in "connectivity", connecting computers together to share resources. Even though the computers can have different disk operating systems, languages, cabling and locations, they still can communicate to one another and share resources. The purpose of Data Communications is to provide the rules and regulations that allow computers with different disk operating systems, languages, cabling and locations to share resources. The rules and regulations are called protocols and standards in Data Communications. During the process of data transmission, the data or information flow in any of the following 3 major ways;

Simplex Transmission
In this case data flows in only one direction on the data communication line (medium). Examples are Radio and Television broadcasts. They go from the TV station to your home television.
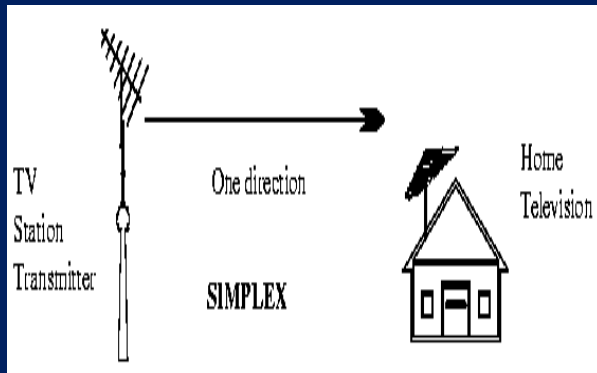
Figure 9a.   Simplex Transmision

Half Duplex Transmission
Data flows in both directions but only one direction at a time on the data communication line. Example. Conversation on walkie-talkies is a half-duplex data flow. Each person takes turns talking. If both talk at once - nothing occurs. Bi-directional but only 1 direction @ a time.
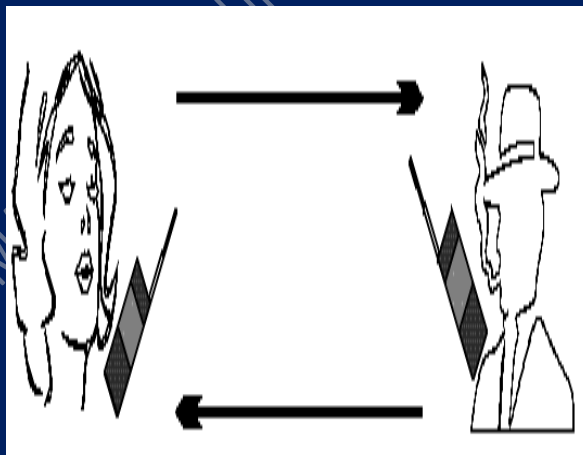
Figure 9b. Half Duplex Transmission

Full Duplex Transmission

Full-Duplex: data flows in both directions simultaneously. Modems are configured to flow data in both directions. Bi-directional both directions simultaneously.
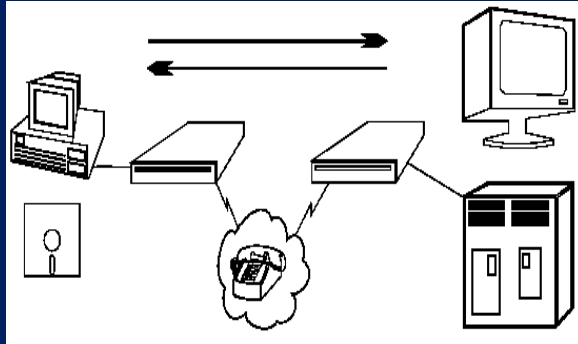
Figure 9c. Full Duplex Transmission

9.2   Description Of Computer Network

A computer network is a telecommunications network that connects a collection of computers to allow communication and data exchange between systems, software applications, and users. The computers that are involved in the network that originate, route and terminate the data are called nodes. The interconnection of computers is accomplished with a combination of cable or wireless media and networking hardware.

Two devices are said to be networked when a process in one device is able to exchange information with a process in another device. Networks may be classified by various characteristics, such as the media used to transmit signals, the communications protocols used to organize network traffic, network scale, network topology and organizational scope. The best-known computer network is the Internet.

Communication protocols define the rules and data formats for exchanging information in a computer network. Well-known communications protocols include Ethernet, a hardware and link layer standard that is widely used for local area networks, and the Internet protocol suite (TCP/IP), which defines a set of protocols for communication between multiple networks, for host-to-host data transfer, and for application-specific data transmission formats. Protocols provide the basis for network programming. Computer networks are created to support many different sorts of services such as World Wide Web, file servers, email, instant messaging and printing.

9.3   Computer Network Topology

In computer networking, topology refers to the layout of connected devices. This article introduces the standard topologies of networking. Think of a topology as a network's virtual shape or structure. This shape does not necessarily correspond to the actual physical layout of the devices on the network. For example, the computers on a home LAN may be arranged in a circle in a family room, but it would be highly unlikely to find a ring topology there. Network topologies are categorized into the following basic types:

9.3.1   Bus Topology

Bus networks (not to be confused with the system bus of a computer) use a common backbone to connect all devices. A single cable, the backbone functions as a shared communication medium that devices attach or tap into with an interface connector. A device wanting to communicate with another device on the network sends a broadcast message onto the wire that all other devices see, but only the intended recipient actually accepts and processes the message. Ethernet bus topologies are relatively easy to install and don't require much cabling compared to the alternatives. 10Base-2 ("ThinNet") and 10Base-5 ("ThickNet") both were popular Ethernet

cabling options many years ago for bus topologies. However, bus networks work best with a limited number of devices. If more than a few dozen computers are added to a network bus, performance problems will likely result. In addition, if the backbone cable fails, the entire network effectively becomes unusable.
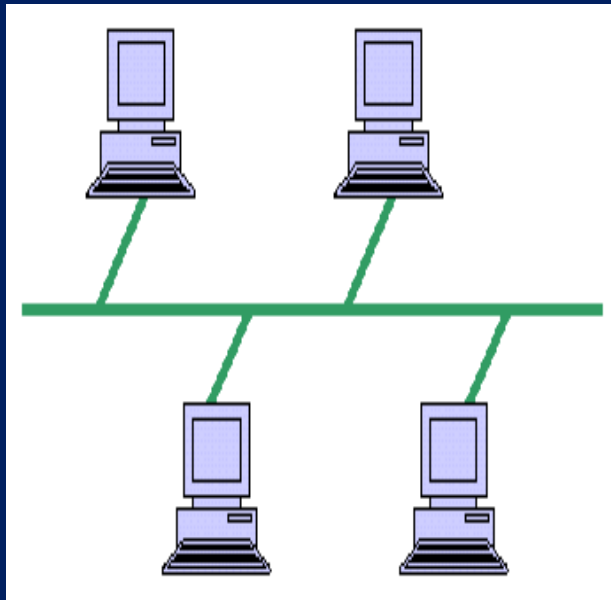
Figure 9d. Bus topology

9.3.2   Ring Topology

In a ring network, every device has exactly two neighbors for communication purposes. All messages travel through a ring in the same direction (either "clockwise" or "counterclockwise"). A failure in any cable or device breaks the loop and can take down the entire network.

To implement a ring network, one typically uses FDDI, SONET, or Token Ring technology. Ring topologies are found in some office buildings or school campuses.
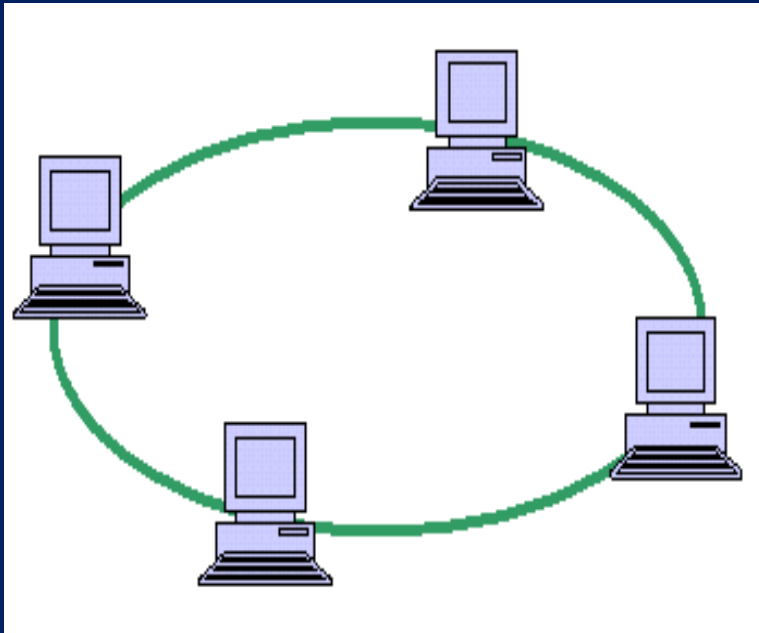
Figure 9e. Ring topology

9.3.3 Star Topology

Many home networks use the star topology. A star network features a central connection point called a "hub node" that may be a network hub, switch or router. Devices typically connect to the hub with Unshielded Twisted Pair (UTP) Ethernet.

Compared to the bus topology, a star network generally requires more cable, but a failure in any star network cable will only take down one computer's network access and not the entire LAN. (If the hub fails, however, the entire network also fails.
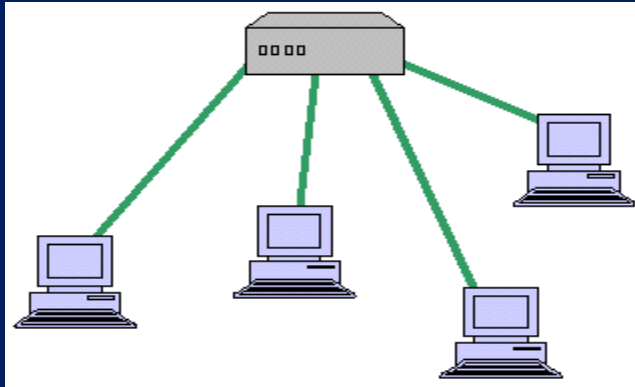
Figure 9f. Star topology

9.3.4 Tree Topology

Tree topologies integrate multiple star topologies together onto a bus. In its simplest form, only hub devices connect directly to the tree bus, and each hub functions as the root of a tree of devices. This bus/star hybrid approach supports future expandability of the network much better than a bus (limited in the number of devices due to the broadcast traffic it generates) or a star (limited by the number of hub connection points) alone.
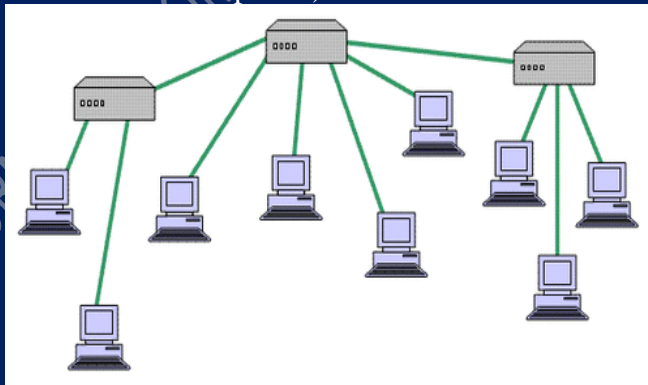
Figure 9g. Tree topology

9.3.5   Mesh Topology

Mesh topologies involve the concept of routes. Unlike each of the previous topologies, messages sent on a mesh network can take any of several possible paths from source to destination. (Recall that even in a ring, although two cable paths exist, messages can only travel in one direction.) Some WANs, most notably the Internet, employ mesh routing. A mesh network in which every device connects to every other is called a full mesh. As shown in the illustration below, partial mesh networks also exist in which some devices connect only indirectly to others.
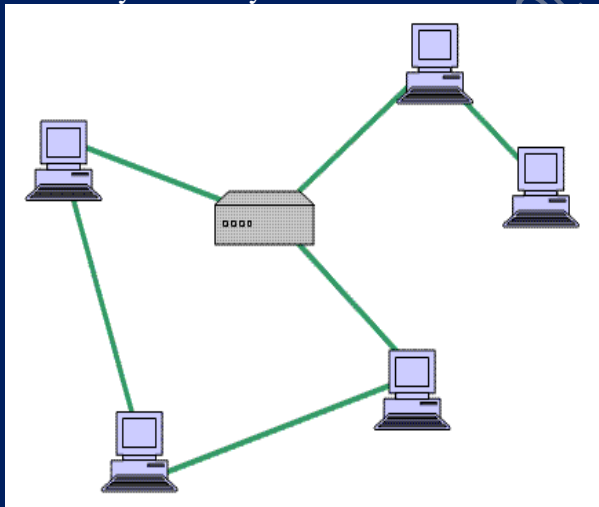
Figure 9h. Mesh topology

9.4   Computer Network Protocol

A communication protocol is a description of the rules that communication devices must follow to communicate with each other. In computer networking we have different types of protocols. The protocols can be divided into two major categories: TCP/IP and Other Protocols.

TCP/IP

TCP/IP is the communication protocol for communication between computers on the Internet. TCP/IP stands for **T**ransmission **C**ontrol **P**rotocol / **I**nternet **P**rotocol. TCP/IP defines how electronic devices (like computers) should be connected to the Internet, and how data should be transmitted between them. TCP/IP is the major protocol in communication network that communication can do without. Inside the TCP/IP standard there are several protocols for handling data communication these are:

- TCP (Transmission Control Protocol) communication between applications
- UDP (User Datagram Protocol) simple communication between applications
- IP (Internet Protocol) communication between computers
- ICMP (Internet Control Message Protocol) for errors and statistics
- DHCP (Dynamic Host Configuration Protocol) for dynamic addressing

TCP Uses a Fixed Connection

TCP takes care of the communication between your application software (i.e. your browser) and your network software. TCP is responsible for breaking data down into IP packets before they are sent, and for assembling the packets when they arrive. TCP is for communication between applications.

If one application wants to communicate with another via TCP, it sends a communication request. This request must be sent to an exact address. After a "handshake" between the two applications, TCP will set up a "full-duplex" communication between the two applications. The "full-duplex" communication will occupy the communication line between the two computers until it is closed by one of the two applications.

Internet Protocol

The Network Layer protocol for TCP/IP is the Internet Protocol (IP). It uses IP addresses and the subnet mask to determine whether the datagram is on the local or a remote network. If it is on the remote network, the datagram is forwarded to the default gateway which is a router that links to another network. IP keeps track of the number of transverses through each router that the datagram goes through to reach its destination. Each transvers is called a hop. If the hop count exceeds 255 hops, the datagram is removed and the destination considered unreachable. IP's name for the hop count is called Time to Live (TTL). IP is for communication between computers. IP is a "connection-less" communication protocol. IP does not occupy the communication line between two computers. IP reduces the need for network lines. Each line can be used for communication between many different computers at the same time. With IP, messages (or other data) are broken up into small independent "packets" and sent between computers via the Internet. IP is responsible for "routing" each packet to the correct destination.

9.5   Description of Internet

Internet the international networks, is a worldwide "network of networks" that consists of millions of smaller domestic, academic, business, and government computer networks, which together carry various information and services, such as electronic mail, online chat, file transfer, and the interlinked Web pages and other documents of the World Wide Web. Major advantages of internet in business organization is electronic communication in business which includes, Electronic mail (e-mail), Electronic Commerce (e-commerce), Electronic Business (e-business), Business-to-Employee (B2E), Business-to-Business (B2B), Business-to-Government (B2G).

Advantages of Internet

1. **Global Audience:** Content published on the World Wide Web is immediately available to a global audience of users. This makes the World Wide Web a very cost-effective medium to publish information. Reaching more than 190 countries

2. **Operates 24 hours, 7 days a week:** You don't need to wait until resources are available to conduct business. From a consumer's perspective as well as a provider's business can be consummated at any time. The fact that the Internet is operational at all times makes it the most efficient business machine to date.

3. **Relatively Inexpensive:** It is relatively inexpensive to publish information on the Internet. At a fraction of the cost to publish information by traditional methods, various organizations and individuals can now distribute information to millions of users. It costs only a few thousand dollars to establish an Internet presence and publish content on the Internet.

4. **Immediate Distribution of Information:** When information is added to a Web site, it's immediately available for browsing by millions of Internet users. The World Wide Web is an ideal medium of information distribution because it takes away the time lag associated with publishing content and actually making it available to users

5. **Easy Integration with Internal Information Systems:** Internet information systems deployed on the Internet can be easily integrated with internal information systems managed

with office productivity applications such as Microsoft Office.

6. **Multimedia:** The capability to incorporate multimedia into Web pages is a major advantage of using World Wide Web to publish information. For example, many Web sites use sounds and video clips to make the content easier and more interesting to browse.

7. **Formatting Capabilities:** Content published on the World Wide Web can be richly formatted by using various HTML tags and graphic formats. The capability to do this is a major reason for the success of the World Wide Web. In addition to using HTML tags and various multimedia formats in Web pages, various interactive controls can also be added to a web page. This capability allows Web site content developers to create "active" Web sites. For example, before a user sends some information to a Web server for processing, a VBScript or JavaScript subroutine can be used to verify information typed in by the user. Various formatting capabilities, along with technologies such as Java and VBScript, make the World Wide Web a richly interactive medium that you can use to distribute information to millions of users.

9.6 Electronic Mail In Business Organization

Electronic mail, popular known as e-mail has become sin-qua-non in business communication. is a method of exchanging digital messages from an author to one or more recipients. Modern email operates across the Internet or other computer networks. Some early email systems required that the author and the recipient both be online at the same time, in common with instant messaging. Today's email systems are based on a store-and-forward model. Email

servers accept, forward, deliver, and store messages. Neither the users nor their computers are required to be online simultaneously; they need connect only briefly, typically to an email server, for as long as it takes to send or receive messages. Some it advantages and disadvantages are discussed below.

Advantages of Emails

    i.   Emails are easy to use. You can organize your daily correspondence, send and receive electronic messages and save them on computers.

    ii.   Emails are fast. They are delivered at once around the world. No other form of written communication is as fast as an email.

    iii.   The language used in emails is simple and informal.

    iv.   When you reply to an email you can attach the original message so that when you answer the recipient knows what you are talking about. This is important if you get hundreds of emails a day.

    v.   It is possible to send automated emails with a certain text. In such a way it is possible to tell the sender that you are on vacation. These emails are called auto responders.

    vi.   Emails do not use paper. They are environment friendly and save a lot of trees from being cut down.

    vii.   Emails allow audio and visual data to be transmitted.

    viii.   Products can be advertised with emails. Companies can reach a lot of people and inform them in a short time.

Disadvantages of Emails

    i.   Emails may carry viruses. These are small programs that harm your computer system. They can read out your email address book and send themselves to a number of people around the world.

ii. Many people send unwanted emails to others. These are called spam mails. It takes a lot of time to filter out the unwanted emails from those that are really important.

iii. Emails cannot really be used for official business documents. They may be lost and you cannot sign them.

iv. Your mailbox may get flooded with emails after a certain time so you have to empty it from time to time.

9.7   Review Question

1. Define Data Communication. Hence give the major interest of data communication
2. What is the purpose of Data Communications
3. Describe with example, the 3 major mode of data flow during data transmission.
4. Explain briefly the following
    i. Computer Network
    ii. Network Topology
    iii. Network Protocol
    iv. Network node
5. Identify and explain any 3 network topology you know.
6. Describe the function of TCP/IP
7. Describe any 5 general advantages of Internet
8. Describe e-mail and give any 5 advantages and 5 dis advantages of email usage.

Chapter Ten

Accessing Computer System through Windows Operating System

10.1   Windows Desktop

Desktop is the main screen area that you see after you turn on your computer and log on to Windows. Like the top of an actual desk, it serves as a surface for your work. When you open programs or folders, they appear on the desktop. You can also put things on the desktop, such as files and folders, and arrange them in the way you want. Desktop is made up of Desktop icons. Figure 11a shows a typical window desktop with some icons.

Figure 10a. Windows Desktop

The desktop is sometimes defined more broadly to include the taskbar. The taskbar sits at the bottom of your screen. It shows you which programs are running and allows you to switch between them. It also contains the Start button 🔵, which you can use to access programs, folders, and computer settings.

10.1.1   Working With Desktop Icons

Icons are small pictures that represent files, folders, programs, and other items that you have on your system. Double-clicking a desktop icon starts or opens the item it represents. When you first start Windows, you'll see some of these icons on your desktop: The Recycle Bin, my computer etc. Some examples of desktop icons are shown below.

Figure 10b. Examples of Desktop Icons

Practice 1
Adding and Removing Icons from the Desktop
You can choose which icons appear on the desktop—you can add or remove an icon at any time. Some people like a clean, uncluttered desktop with few or no icons. Others place dozens of icons on their desktop to give them quick access to frequently used programs, files, and folders.

If you want easy access from the desktop to your favorite files or programs, you can create shortcuts to them. A shortcut is an icon that represents a link to an item, rather than the item itself. When you double-click a shortcut, the item opens. If you delete a shortcut, only the shortcut is removed, not the original item. You can identify shortcuts by the arrow on their icon. See the diagram in figure 11c.
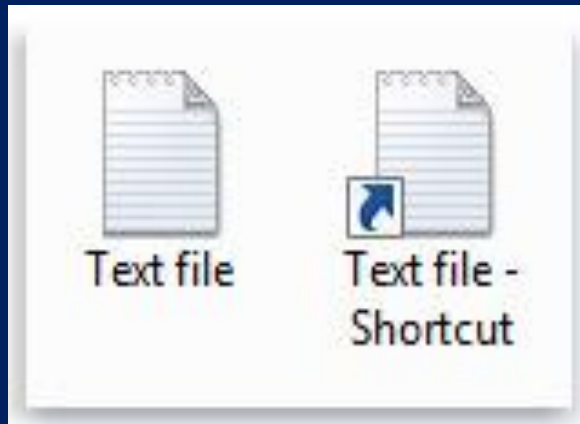
Figure 10c. File icon (left) and a shortcut icon (right)

Practice 2
Adding a Shortcut to the Desktop
   i.   Locate the item that you want to create a shortcut for.
   ii.   Right-click the item, click Send to, and then click Desktop (create shortcut).
   iii. The shortcut icon appears on your desktop.

Practice 3
Moving a file from a folder to the desktop
   i.   Open the folder that contains the file.
   ii.   Drag the file to the desktop.

Practice 4
Removing an Icon from the Desktop
Right-click the icon, and then click Delete.
If the icon is a shortcut, only the shortcut is removed; the original item is not deleted.

Practice 4
Moving Icons Around
Windows stacks icons in columns on the left side of the desktop. But you're not stuck with that arrangement. You can move an icon by dragging it to a new place on the desktop. You can also have Windows automatically arrange your icons.

    i.   Right-click an empty area of the desktop,
    ii.   Click View, and then click Auto arrange icons.

Windows stacks your icons in the upper-left corner and locks them in place. To unlock the icons so that you can move them again, click Auto arrange icons again, clearing the check mark next to it.
By default, Windows spaces icons evenly on an invisible grid. To place icons closer together or with more precision, turn off the grid.

    i.   Right-click an empty area of the desktop,
    ii.   Point to View, and then click Align icons to grid to clear the check mark.
   iii.   Repeat the steps to turn the grid back on.

Practice 5
Selecting Multiple Icons
To move or delete a bunch of icons at once, you must first select all of them. Click an empty area of the desktop and drag the mouse. Surround the icons that you want to select with the rectangle that

appears. Then release the mouse button. Now you can drag the icons as a group or delete them.

Practice 6
Hiding Desktop Icons
If you want to temporarily hide all of your desktop icons without actually removing them.

    i.   Right-click an empty part of the desktop
   ii.   Click View, and then click Show desktop icons to clear the check mark from that option.

Now no icons are displayed on the desktop. You can get them back by clicking Show desktop icons again.

10.1.2   The Recycle Bin

When you delete a file or folder, it doesn't actually get deleted right away, it goes to the Recycle Bin. That's a good thing, because if you ever change your mind and decide you need a deleted file, you can get it back.

Figure 10d. Recycle Bin when empty (left) and full (right)

If you're sure that you won't need the deleted items again, you can empty the Recycle Bin. Doing that will permanently delete the items and reclaim any disk space they were using.

10.2   The Start Menu

The Start menu is the main gateway to your computer's programs, folders, and settings. It's called a menu because it provides a list of choices, just as a restaurant menu does. And as "start" implies, it's often the place that you'll go to start or open things.
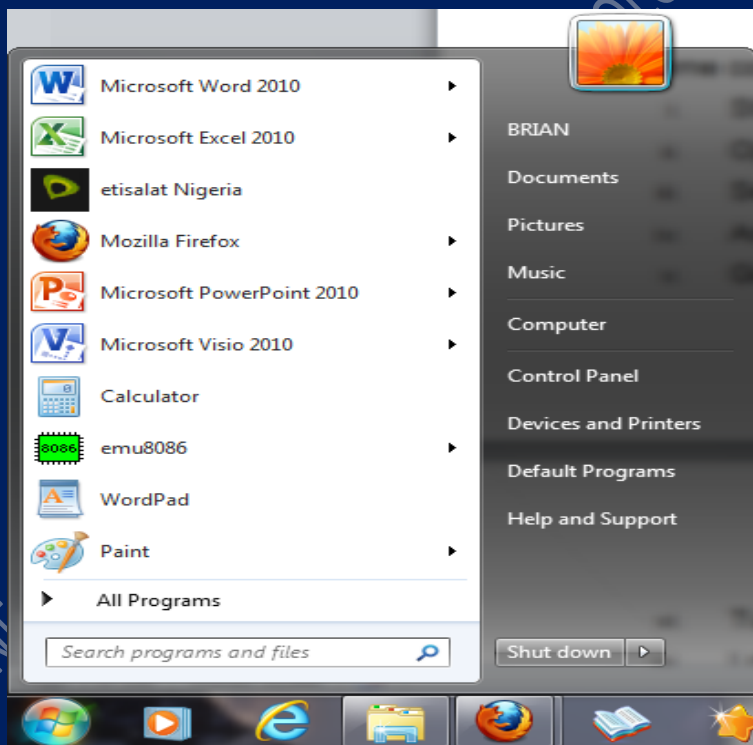
Figure 10e.   Start menu

Some common activities we use the start menu for are:
- i.   Start programs
- ii.   Open commonly used folders
- iii.   Search for files, folders, and programs
- iv.   Adjust computer settings
- v.   Get help with the Windows operating system
- vi.   Turn off the computer
- vii.   Log off from Windows or switch to a different user account

Practice 7
Open the Start Menu
Click the Start button in the lower-left corner of your screen. Or, press the Windows logo key on your keyboard. The Start menu has three basic parts;

- i.   The large left pane shows a short list of programs on your computer. Your computer manufacturer can customize this list, so its exact appearance will vary. Clicking All Programs displays a complete list of programs (more on this later).
- ii.   At the bottom of the left pane is the search box, which allows you to look for programs and files on your computer by typing in search terms.
- iii.   The right pane provides access to commonly used folders, files, settings, and features. It's also where you go to log off from Windows or turn off your computer.

Practice 8
Opening Programs from the Start Menu
One of the most common uses of the Start menu is opening programs installed on your computer. To open a program shown in the left pane of the Start menu, click it. The program opens and the Start menu closes.

If you don't see the program you want, click All Programs at the bottom of the left pane. The left pane displays a long list of programs in alphabetical order, followed by a list of folders. Clicking the program icons starts the program, and the Start menu closes. If you're ever unsure what a program does, move the pointer over its icon or name.

A box appears that often contains a description of the program. For example, pointing to Calculator displays this message: "Performs basic arithmetic tasks with an on-screen calculator." This trick works for items in the right pane of the Start menu, too.

You might notice that over time, the lists of programs in your Start menu change. This happens for two reasons.

i.   When you install new programs, they get added to the All Programs list.
ii.   The Start menu detects which programs you use the most, and places them in the left pane for quick access.

10.2.1   The Search Box

The search box is one of the most convenient ways to find things on your computer. The exact location of the items doesn't matter, the search box will scour your programs and all of the folders in your personal folder (which includes Documents, Pictures, Music, Desktop, and other common locations). It will also search your e-mail messages, saved instant messages, appointments, and contacts.
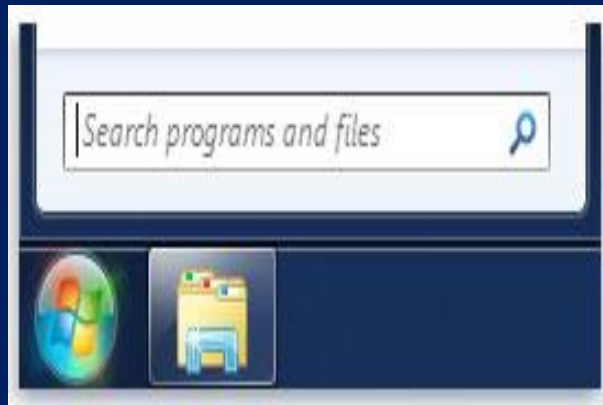
Figure 10f.   Start menu search box

Practice 9
To use the search box
Open the Start menu and typed the name of information you are looking for. You don't need to click inside the box first. As you type, the search results appear above the search box in the left pane of the Start menu.

A program, file, or folder will appear as a search result if:
   i.   Any word in its title matches or begins with your search term.
  ii.   Any text in the actual contents of the file—such as the text in a word-processing document—matches or begins with your search term.
 iii.   Any word in a property of the file, such as the author, matches or begins with your search term.

Click any search result to open it. Or, click the Clear button ☒ to clear the search results and return to the main programs list. You can also click See more results to search your entire computer. Besides searching programs, files and folders, and communications, the

search box also looks through your Internet favorites and the history of websites you've visited. If any of these webpages include the search term, they appear under a heading called "Files."

10.2.2   Start Menu Right Pane

The right pane of the Start menu contains links to parts of Windows that you're likely to use frequently. Here they are, from top to bottom:

i.   Personal folder. Opens your personal folder, which is named for whoever is currently logged on to Windows. For example, if the current user is Molly Clark, the folder will be named Molly Clark. This folder, in turn, contains user-specific files, including the My Documents, My Music, My Pictures, and My Videos folders.

ii.   Documents. Opens the Documents library, where you can access and open text files, spreadsheets, presentations, and other kinds of documents.

iii. Pictures. Opens the Pictures library, where you can access and view digital pictures and graphics files.

iv.   Music. Opens the Music library, where you can access and play music and other audio files.

v.   Games. Opens the Games folder, where you can access all of the games on your computer.

vi.   Computer. Opens a window where you can access disk drives, cameras, printers, scanners, and other hardware connected to your computer.

vii. Control Panel. Opens Control Panel, where you can customize the appearance and functionality of your computer, install or uninstall programs, set up network connections, and manage user accounts.

viii. Devices and Printers. Opens a window where you can view information about the printer, mouse, and other devices installed on your computer.

ix.   Default Programs. Opens a window where you can choose which program you want Windows to use for activities such as web browsing.
x.   Help and Support. Opens Windows Help and Support, where you can browse and search Help topics about using Windows and your computer. See Getting help.

At the bottom of the right pane is the Shutdown button. Click the Shutdown button to turn off your computer.

Clicking the arrow next to the Shutdown button displays a menu with additional options for switching users, logging off, restarting, or shutting down.
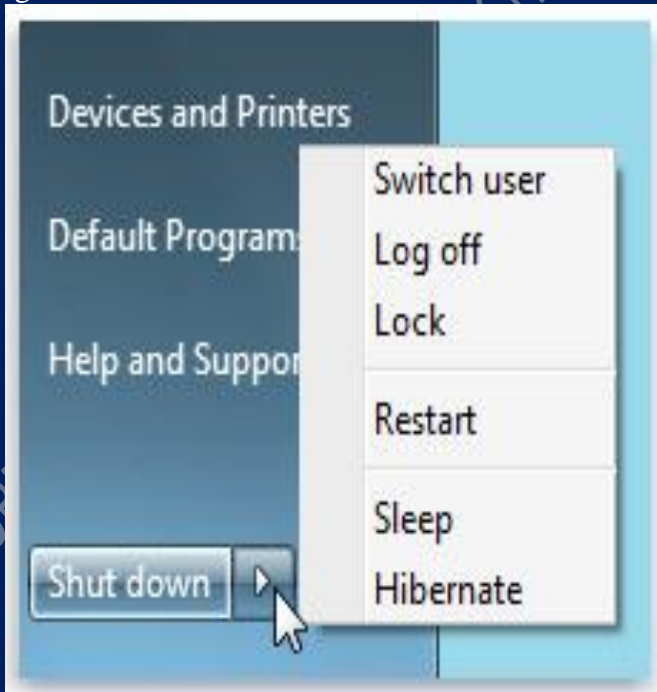
Figure 10g. Shut Down Options in the Start Menu

Practice 10
Customize the Start Menu
We can control which items appear in the Start menu. For example, you can pin icons for your favorite programs to the Start menu for easy access, or remove programs from the list. You can also hide or show certain items in the right pane.

To pin a program icon to the Start menu: If you use a program regularly, you can create a shortcut to it by pinning the program icon to the Start menu. Pinned program icons appear on the left side of the Start menu.

    i.   Right-click the program icon you want to pin to the Start menu, and then click Pin to Start Menu.
    ii.   To unpin a program icon, right-click it, and then click Unpin from Start Menu.

To remove a program icon from the Start menu: Removing a program icon from the Start menu doesn't remove it from the

All Programs list or uninstall the program.
    i.   Click the Start button
    ii.   Right-click the program icon you want to remove from the Start menu, and then click Remove from this list.

To move the Start button: The Start button is located on the taskbar. Although you can't remove the Start button from the taskbar, you can move the taskbar—and the Start button along with it.
    i.   Right-click an empty space on the taskbar. If Lock the taskbar has a check mark beside it, click it to remove the check mark.
    ii.   Click an empty space on the taskbar, and then hold down the mouse button as you drag the taskbar to one of the four edges of the desktop. When the taskbar is where you want it, release the mouse button.

Note: To lock the taskbar into place, right-click an empty space on the taskbar, and then click Lock the Taskbar so that the check mark reappears. Locking the taskbar helps prevent it from being moved or resized accidentally.

Practice 11
Open Taskbar and Start Menu Properties

       i.   Click the Start button.
      ii.   Click Control Panel
    iii.   Click Appearance and Personalization
    iv.   Click Taskbar and Start Menu

Practice 12
To clear recently opened programs: Clear the Store and display recently opened programs in the Start menu check box.
To clear recently opened files: Clear the Store and display recently opened items in the Start menu and the taskbar check box, and then click OK.

Practice 13
To adjust the number of shortcuts for frequently used programs
The Start menu displays shortcuts for the programs you use most frequently. You can change the number of program shortcuts displayed (this can affect the height of the Start menu).
i.   Open Taskbar and Start Menu Properties by clicking the Start button,
ii.   Clicking Control Panel,
iii.   Clicking Appearance and Personalization, and then clicking Taskbar and Start Menu.
iv.   Click the Start Menu tab, and then click Customize.

v. In the Customize Start Menu dialog box, in the Number of recent programs to display box, enter the number of programs you want to display on the Start menu,

vi. Click OK

Practice 14
To customize the right pane of the Start menu
We can add or remove items, such as Computer, Control Panel, and Pictures, that appear on the right side of the Start menu. You can also change some items so that they appear as links or menus.

i. Open Taskbar and Start Menu Properties
ii. Clicking Control Panel
iii. Clicking Appearance and Personalization
iv. Clicking Taskbar and Start Menu
v. Click the Start Menu tab, and then click Customize.
vi. In the Customize Start Menu dialog box, select the options in the list that you want, click OK, and then click OK again.

Practice 15
To restore Start menu default settings
We can restore the Start menu to its original, default settings.

i. Open Taskbar and Start Menu Properties
ii. Clicking Control Panel
iii. Clicking Appearance and Personalization
iv. Clicking Taskbar and Start Menu
v. Click the Start Menu tab, and then click Customize.
vi. In the Customize Start Menu dialog box, click Use Default Settings, click OK, and then click OK again.

To search for programs from the Start menu: Click the Start button Picture of the Start button, and then type a word or phrase in the search box.

10.3   The Taskbar

The taskbar is the long horizontal bar at the bottom of your screen. Unlike the desktop, which can get obscured by open windows, the taskbar is almost always visible. It has three main sections:

    i.   The Start button, which opens the Start menu.

   ii.   The middle section, which shows you which programs and files you have open and allows you to quickly switch between them.

  iii.   The notification area, which includes a clock and icons (small pictures) that communicate the status of certain programs and computer settings.

If we open more than one program or file at a time, you can quickly start piling up open windows on your desktop. Because windows often cover each other or take up the whole screen, it's sometimes hard to see what else is underneath or remember what you've already opened. That's where the taskbar comes in handy. Whenever you open a program, folder, or file, Windows creates a corresponding button on the taskbar. The button shows an icon that represents the open program. In the diagram figure10h below, two programs are open. Calculator and Minesweeper, and each has its own button on the taskbar.

Taskbar buttons

Figure 10h. Program with its own button on the taskbar

Notice how the taskbar button for Minesweeper is highlighted. That indicates that Minesweeper is the active window, meaning that it's in front of any other open windows and is ready for you to interact with. To switch to another window, click its taskbar button. In this example, clicking the taskbar button for Calculator brings its window to the front.
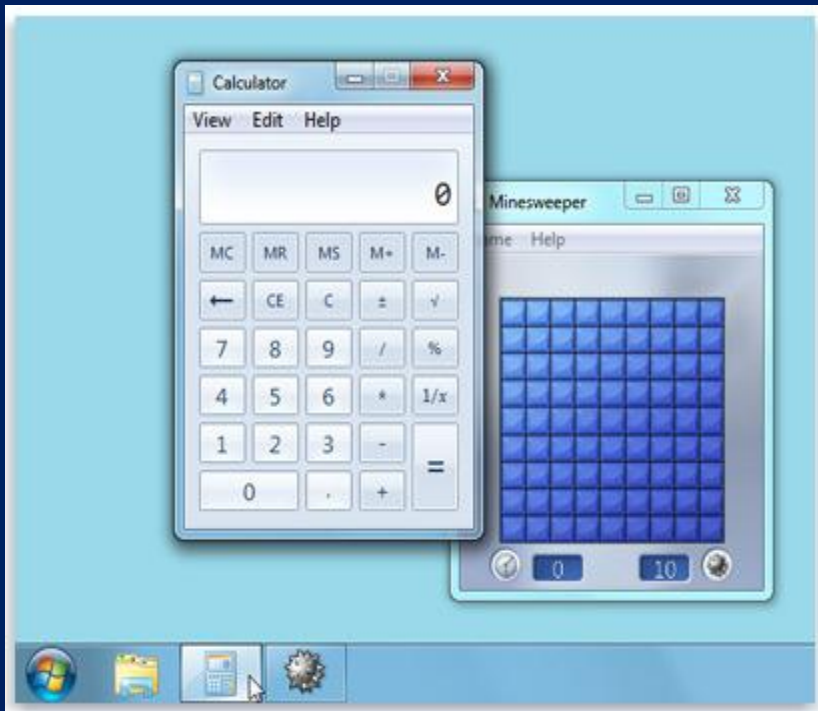
Figure 10i. Taskbar button shown calculator window active

Practice 14
Minimize and Restore Windows

When a window is active (its taskbar button is highlighted), clicking its taskbar button minimizes the window. That means that the window disappears from the desktop. Minimizing a window doesn't close it or delete its contents, it temporarily removes it from the desktop. In the figure 10j below, Calculator is minimized, but not closed. You can tell it's still running because it has a button on the taskbar.
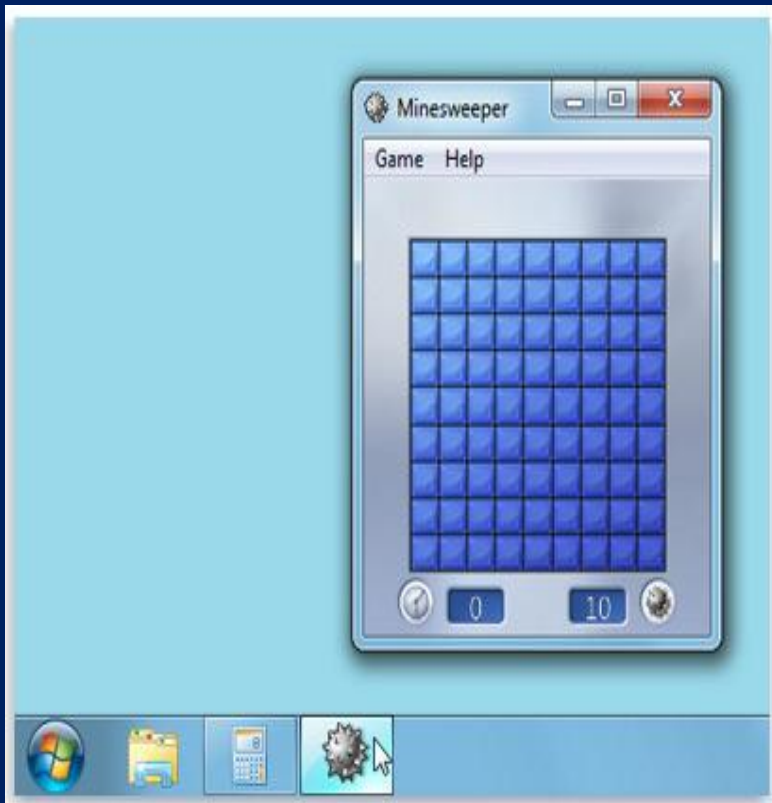
Figure 10j. Minimizing minesweeper leaves only its taskbar button visible

You can also minimize a window by clicking the minimize button in the upper-right corner of the window.

Figure 10k. Minimize button (left)

To restore a minimized window (make it show up again on the desktop), click its taskbar button.

Practice 15
To See Previews of Open Windows
When we move our mouse pointer to a taskbar button, a small picture appears that shows you a miniature version of the corresponding window. This preview, also called a **thumbnail**, is especially useful. And if one of your windows has video or animation playing, you'll see it playing in the preview. We can see thumbnails only if **Aero** can run on your computer and you're running a Windows 7 theme.

The Notification Area
The notification area, at the far right of the taskbar, includes a clock and a group of icons. It looks like figure 10l.

Figure 10l. The notification area, at the far right of the taskbar

These icons communicate the status of something on your computer or provide access to certain settings. The set of icons you see depends on which programs or services you have installed and how your computer manufacturer set up your computer. When you move your pointer to a particular icon, you will see that icon's name or the status of a setting. For example, pointing to the volume icon 🔊 shows the current volume level of your computer. Pointing to the network icon 🖳 displays information about whether you are connected to a network, the connection speed, and the signal strength. Double-clicking an icon in the notification area usually opens the program or setting associated with it. For example, double-clicking the volume icon opens the volume controls. Double-clicking the network icon opens Network and Sharing Center.
Occasionally, an icon in the notification area will display a small pop-up window (called a notification) to notify you about something. For example, after adding a new hardware device to your computer, you might see the diagram in figure 10m.

Figure 10m. The notification area displays a message after new hardware is installed

Click the Close button ☒ in the upper-right corner of the notification to dismiss it. If you don't do anything, the notification will fade away on its own after a few seconds.

To reduce clutter, Windows hides icons in the notification area when you haven't used them in a while. If icons become hidden, click the Show hidden icons button to temporarily display the hidden icons figure 10n.
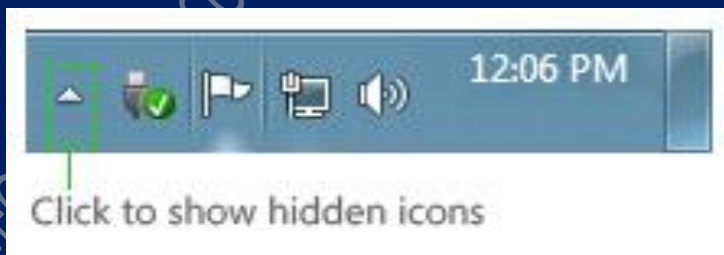
Figure11n. Hidden icons button

Practice 16
Customize the Taskbar
There are many ways to customize the taskbar to suit your preferences. For example, you can move the entire taskbar to the left, right, or top edge of the screen. You can make the taskbar larger, have Windows automatically hide it when you're not using it, and add toolbars to it. By default taskbar is located at the bottom edge of your window desk top but it can be move to left, right, and top of desktop by following this procedures.

i. Open Taskbar and Start Menu Properties
ii. Clicking Control Panel
iii. Clicking Appearance and Personalization
iv. Clicking Taskbar and Start Menu
v. Click the Start Menu tab.
vi. Select the options from taskbar location on the screen from the dialog box

10.4   Desktop Gadgets
Windows contains mini-programs called **gadgets**, which offer information at a glance and provide easy access to frequently used tools. For example, you can use gadgets to display a picture slide show or view continuously updated headlines. Some of the gadgets that come with Windows 7 are:

i. Calendar
ii. Clock
iii. Weather
iv. Feed Headlines
v. Slide Show
vi. Picture Puzzle.

10.4.1 Why Desktop Gadgets

Desktop gadgets can keep information and tools readily available for you to use. For example, you can display news headlines right next to your open programs. This way, if you want to keep track of what's happening in the news while you work, you don't have to stop what you're doing to switch to a news website.

You can use the Feed Headlines gadget to show the latest news headlines from sources you choose. You don't have to stop working on your document, because the headlines are always visible. If you see a headline that interests you, you can click that headline, and your web browser will open directly to the story.

Practice 17
Getting Started With Gadgets

To understand how to use gadgets, we will explore the Clock gadget.

How Does the Clock Work

Right-click the Clock, you'll see a list of things you can do with the gadget, including closing the Clock, keeping it on top of your open windows, and changing the Clock's options (such as its name, time zone, and appearance). Figures 10o illustrate this.
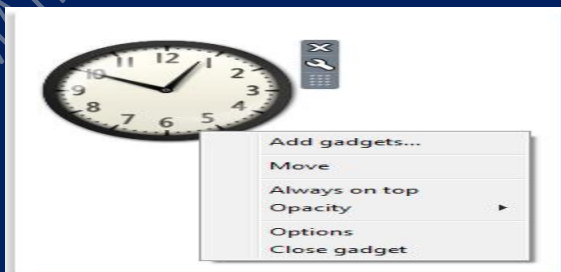
Figure10o. Clock gadget

Which Gadgets Do I Have?
Before a gadget can be added, it must be installed on your computer. To see which gadgets are installed on your computer, do the following:

i. Right-click the desktop and click Gadgets.
ii. Click the scroll buttons to see all the gadgets.
iii. To see information about a gadget, click the gadget, and then click Show details.

Adding and Removing Gadgets
We can add any gadget that's installed on our computer to the desktop. If we want, you can add multiple instances of a gadget. For example, if you are keeping track of time in two time zones, you can add two instances of the Clock gadget and set the time of each accordingly.

To add a gadget
   Right-click the desktop and click Gadgets.
   Double-click a gadget to add it.
To remove a gadget
   Right-click the gadget and then click Close Gadget

10.5   Windows
Whenever we open a program, file, or folder, it appears on our screen in a box or frame called a **window** (that's where the Windows operating system gets its name). It is the platform for which all window base programs run. Because windows are everywhere in Windows, it's important to understand how to move them, change their size, or just make them go away.

10.5.1 Windows Components

Although the contents of every window are different, all windows share some things in common. For one thing, windows always appear on the desktop i.e. the main work area of your screen. In addition, most windows have the same basic components as shown in figure 110p.
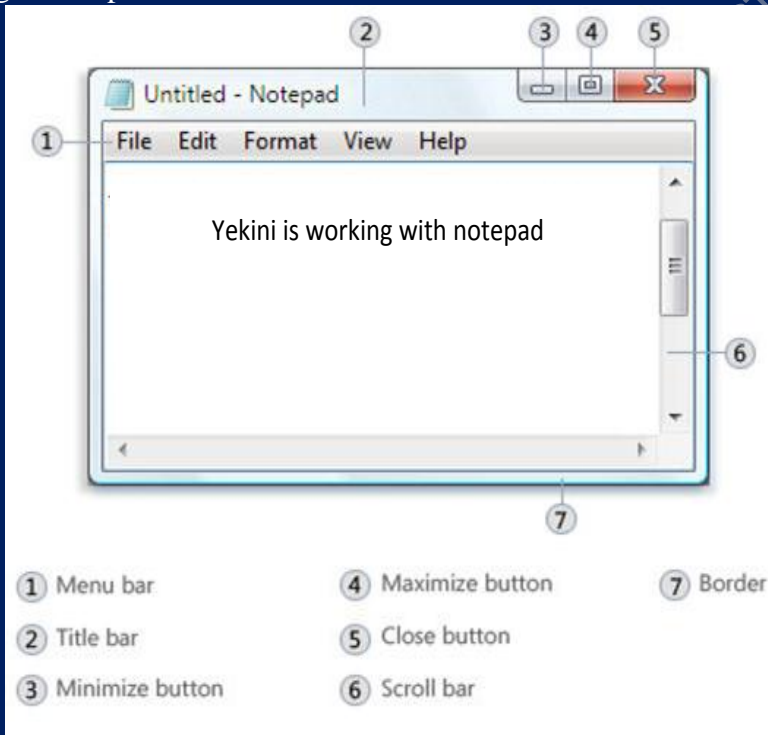
Figure 10p. Parts of a typical window

① Menu bar   ④ Maximize button   ⑦ Border

② Title bar   ⑤ Close button

③ Minimize button   ⑥ Scroll bar

i.   Title bar. Displays the name of the document and program (or the folder name if you're working in a folder).

ii.   Minimize, Maximize, and Close buttons. These buttons hide the window, enlarge it to fill the whole screen, and close it, respectively (more details on these shortly).

iii. Menu bar. Contains items that you can click to make choices in a program. See Using menus, buttons, bars, and boxes.

iv. Scroll bar. for scrolling the contents of the window to see information that is currently out of view.

v. Borders and corners. You can drag these with your mouse pointer to change the size of the window.

Other windows might have additional buttons, boxes, or bars. But they'll usually have the basic parts described.

Practice 18
Moving a Window

To move a window, point to its title bar with the mouse pointer ▸ then drag the window to the location that you want. (Dragging means pointing to an item, holding down the mouse button, moving the item with the pointer, and then releasing the mouse button)

Practice 19
Changing the Size of a Window

i. To make a window fill the entire screen, click its Maximize button ▣ or double-click the window's title bar.

ii. To return a maximized window to its former size, click its Restore button ▣ (this appears in place of the Maximize button). Or, double-click the window's title bar.

iii. To resize a window (make it smaller or bigger), point to any of the window's borders or corners. When the mouse pointer changes to a two-headed arrow as in figure 10q drag the border or corner to shrink or enlarge the window.
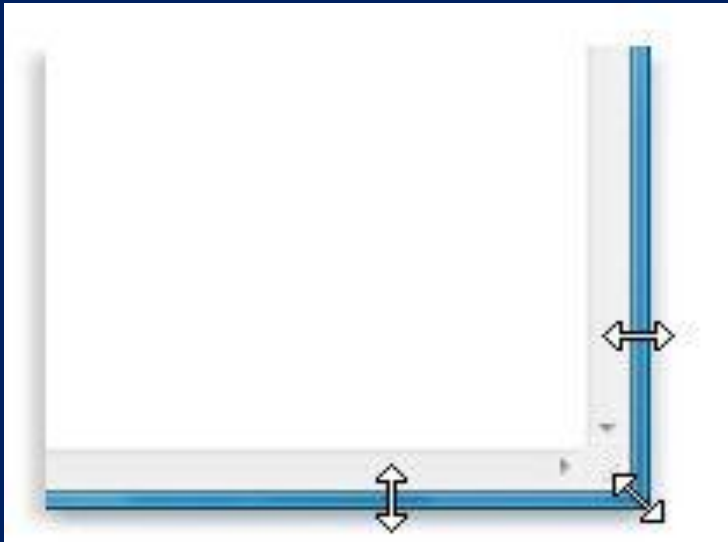
Figure10q. Drag a window's border or corner to resize it

A window that is maximized cannot be resized. You must restore it to its previous size first.

Note: Although most windows can be maximized and resized, there are some windows that are fixed in size, such as dialog boxes.

Practice 20
Hiding a Window
Hiding a window is called minimizing it. If you want to get a window out of the way temporarily without closing it, minimize it. To minimize a window, click its Minimize button . The window disappears from the desktop and is visible only as a button on the taskbar, the long horizontal bar at the bottom of your screen. To make a minimized window appear again on the desktop, click its

taskbar button. The window appears exactly as it did before you minimized it.

Practice 21
Closing a Window

Closing a window removes it from the desktop and taskbar. If you're done with a program or document and don't need to return to it right away, close it.

To close a window, click its Close button ![x].

Note

- If you close a document without saving any changes you made, a message appears that gives you the option to save your changes.

Practice 22
Switching Between Windows

If we open more than one program or document, our desktop can quickly become cluttered with windows. Keeping track of which windows you have open isn't always easy, because some windows might partially or completely cover others.

- **Using the Taskbar**: The taskbar provides a way to organize all of our windows. Each window has a corresponding button on the taskbar. To switch to another window, just click its taskbar button. The window appears in front of all other windows, becoming the active window. To easily identify a window, point to its taskbar button. When you point to a taskbar button, you'll see a thumbnail-sized preview of the window, whether the content of the window is a document, a photo, or even a running video. This preview is especially useful if you can't identify a window by its title alone.

- **Using ALT+TAB**: We can switch to the previous window by pressing Alt +Tab, or cycle through all open windows and the desktop by holding down Alt and repeatedly pressing Tab. Release Alt to show the selected window.

- **Using AERO FLIP 3D:** Aero Flip 3D arranges your windows in a three-dimensional stack that you can quickly flip through. To use Flip 3D we follow the steps below:
    i. Hold down the Windows logo key ⊞ and press Tab to open Flip 3D.
    ii. While holding down the Windows logo key, press Tab repeatedly or rotate the mouse wheel to cycle through open windows. You can also press Right Arrow or Down Arrow to cycle forward one window, or press Left Arrow or Up Arrow to cycle backward one window.
    iii. Release the Windows logo key to display the front most windows in the stack. Or, click any part of any window in the stack to display that window.

Figure10r. Switching between window with Aero Flip 3D

Flip 3D is part of the Aero desktop experience. If your computer doesn't support Aero, you can view the open programs and windows on your computer by pressing Alt+Tab. To cycle through the open windows, you can press the Tab key, press the arrow keys, or use your mouse.

10.5.2 Arranging Windows Automatically

Now that you know how to move and resize windows, you can arrange them however you like on your desktop. You can also have Windows automatically arrange them in one of three ways:

     i.   Cascading
    ii.   Vertically stacked
   iii.   Side by side
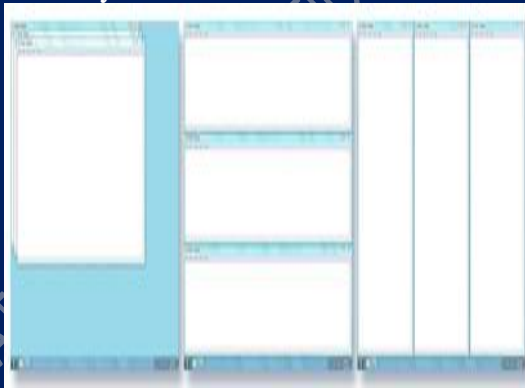
Figure10s. Arrange windows in a cascade (left), vertical stack (center), or side-by-side pattern (right)

Practice 23
Procedures to Choose One of the Options

     i.   Open some windows on your desktop
    ii.   Right-click an empty area of the taskbar

iii.   Click Cascade windows, Show windows stacked, or Show windows side by side.

10.5.3 Arranging Windows Using SNAP

Snap is a quick (and fun) new way to resize open windows, simply by dragging them to the edges of your screen. Depending on where you drag a window, you can make it expand vertically, take up the entire screen, or appear side-by-side with another window. Snap makes reading, organizing, and comparing windows a...well, you get the picture. Snap will automatically resize your windows when you move, or snap, them to the edge of the screen. We can use Snap to arrange windows side by side, expand windows vertically, or maximize a window.

Practice 24
Arrange Windows Side By Side
   i.   Drag the title bar of a window to the left or right side of the screen until an outline of the expanded window appears.
   ii.   Release the mouse to expand the window.
   iii. Repeat steps 1 and 2 with another window to arrange the windows side by side.

Practice 25
Expand a Window Vertically
   i.   Point to the top or bottom edge of an open window until the pointer changes into a double-headed arrow ⬍.
   ii.   Drag the edge of the window to the top or bottom of the screen to expand the window to the entire height of the desktop. The width of the window doesn't change. See figure 10t.
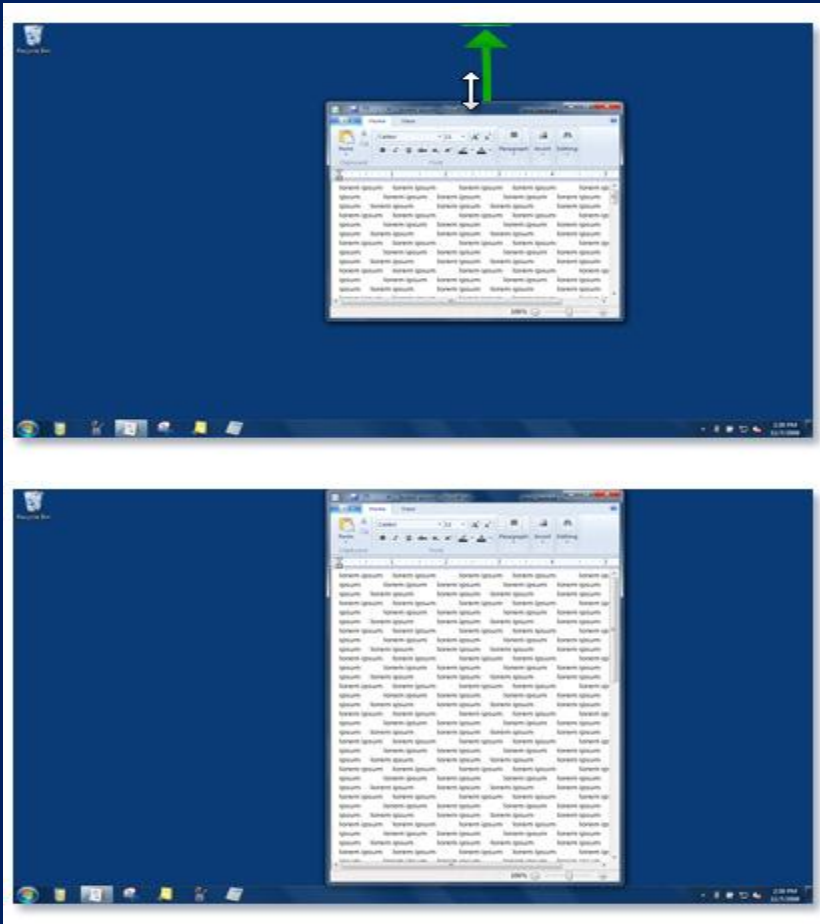
Figure10t. Drag the top or bottom of a window to expand it vertically

Practice 26
Maximize a Window
  i.   Drag the title bar of the window to the top of the screen. The window's outline expands to fill the screen.

ii. Release the window to expand it to fill the entire desktop.

10.6 Dialog Boxes
A dialog box is a special type of window that asks you a question, allows you to select options to perform a task, or provides you with information. It is a medium of communication through which the computer users communicate with computers. We will often see dialog boxes when a program or Windows needs a response from us before it can continue see figure 10u for a save dialog box.
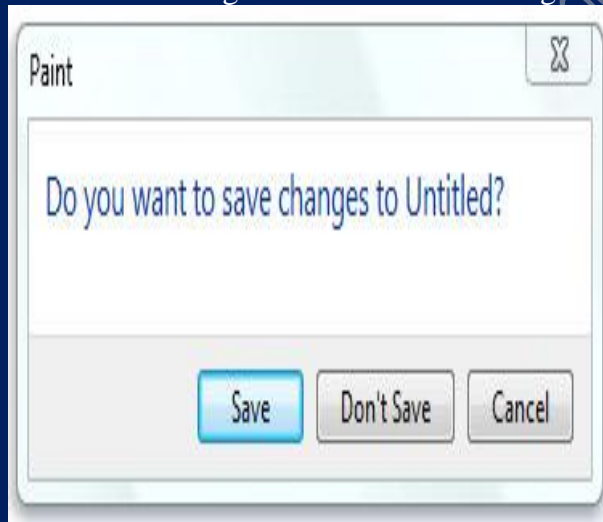
Figure10u. Paint save dialog

Unlike regular windows, most dialog boxes can't be maximized, minimized, or resized. They can, however, be moved.

10.7 Using Menus, Buttons, Bars, and Boxes
Menus, buttons, scroll bars, and check boxes are examples of **controls** that you operate with your mouse or keyboard. These controls allow you to select commands, change settings, or work

with windows. This section describes how to recognize and use controls that you'll encounter frequently while using Windows.

10.7.1 Using Menus

Most programs contain dozens or even hundreds of commands (actions) that you use to work the program. Many of these commands are organized under **menus**. Like a restaurant menu, a program menu shows you a list of choices. To keep the screen uncluttered, menus are hidden until you click their titles in the menu bar, located just underneath the title bar.

To choose one of the commands listed in a menu, click it. Sometimes a **dialog box** appears, in which you can select further options. If a command is unavailable and cannot be clicked, it is shown in gray.

Some menu items are not commands at all. Instead, they open other menus. See figure 10v pointing to "New" open a submenu.
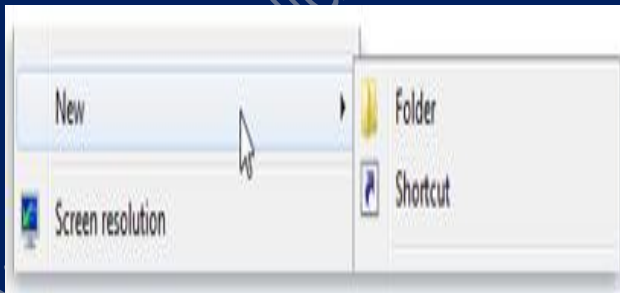

Figure10v. Menu commands that open submenus

If you don't see the command you want, try looking at another menu. Move your mouse pointer along the menu bar and its menus open automatically; you don't need to click the menu bar again. To close a menu without selecting any commands, click the menu bar or any other part of the window.

Recognizing menus isn't always easy, because not all menu controls look alike or even appear on a menu bar. So how can you spot them? When you see an arrow next to a word or picture, you're probably looking at a menu control. Here are some examples:
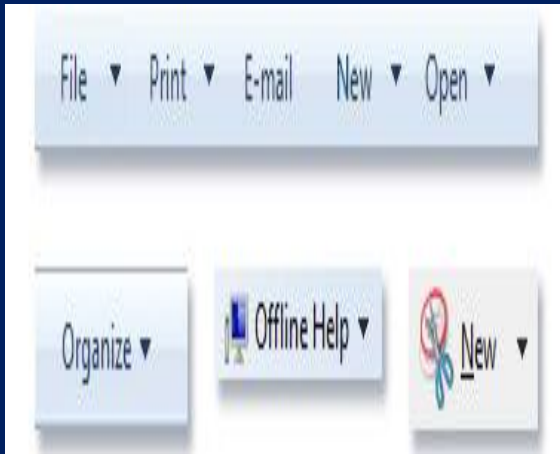

Figure10w. Examples of menu controls

Note:
- If a keyboard shortcut is available for a command, it is shown next to the command.
- You can operate menus using your keyboard instead of your mouse.

10.7.2 Scroll Bars

When a document, webpage, or picture exceeds the size of its window, scroll bars appear to allow you to see the information that is currently out of view. Figure 11v shows the parts of a scroll bar.
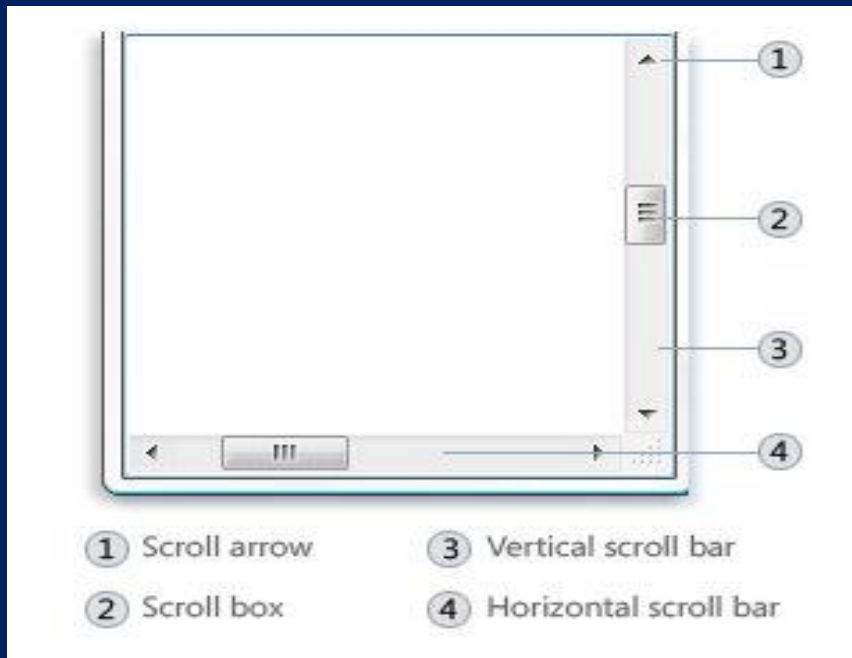
Figure10x. Horizontal and vertical scroll bars

Practice 27
To Use s Scroll Bar:

i.   Click the up or down scroll arrows to scroll the window's contents up or down in small steps. Hold down the mouse button to scroll continuously.

ii.   Click an empty area of a scroll bar above or below the scroll box to scroll up or down one page.

iii.   Drag a scroll box up, down, left, or right to scroll the window in that direction.

If your mouse has a scroll wheel, you can use it to scroll through documents and webpages. To scroll down, roll the wheel backward (toward you). To scroll up, roll the wheel forward (away from you).

10.7.3 Using Command Buttons

A command button performs a command (makes something happen) when you click it. You'll most often see them in dialog boxes, which are small windows that contain options for completing a task. For example, if you close a Paint picture without saving it first, you might see a dialog box as in figure 10u. Save, Don't save and Cancel are command buttons. Clicking Save saves the picture and any changes you've made, and clicking Don't Save deletes the picture and discards any changes you've made. Clicking Cancel dismisses the dialog box and returns you to the program.

Pressing Enter does the same thing as clicking a command button that is selected (outlined).

Outside of dialog boxes, command buttons vary in appearance, so it's sometimes difficult to know what a button is and what isn't. For example, command buttons often appear as small icons (pictures) without any text or rectangular frame. The most reliable way to determine if something is a command button is to rest your pointer on it. If it "lights up" and becomes framed with a rectangle, you've discovered a button. Most buttons will also display some text about their function when you point to them.

If a button changes into two parts when you point to it, you've discovered a split button. Clicking the main part of the button performs a command, whereas clicking the arrow opens a menu with more options.

10.7.4 Using Option Buttons

Option buttons allow you to make one choice among two or more options. They frequently appear in dialog boxes. Figure 10y shows two option buttons. The "Color" option is selected.
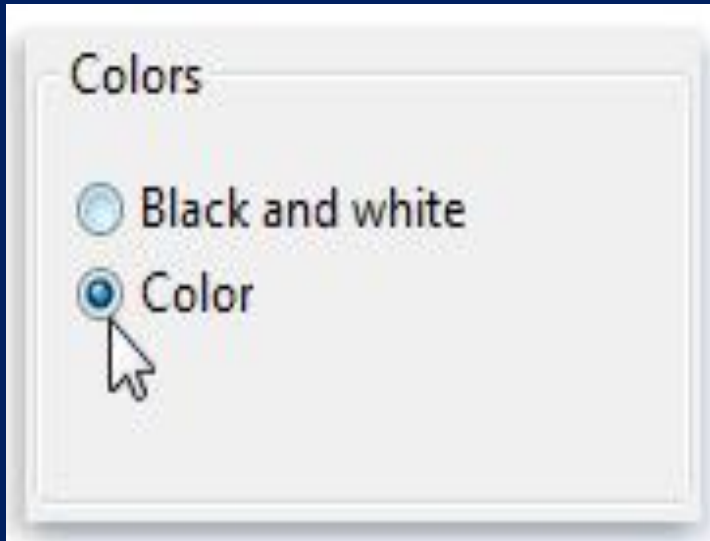

Figure10y. Clicking a button selects that option

To select an option, click one of the buttons. Only one option can be selected.

10.7.5 Using Check Boxes

Check boxes allow you to select one or more independent options. Unlike option buttons, which restrict you to one choice, check boxes allow you to choose multiple options at the same time. See figure 10z.
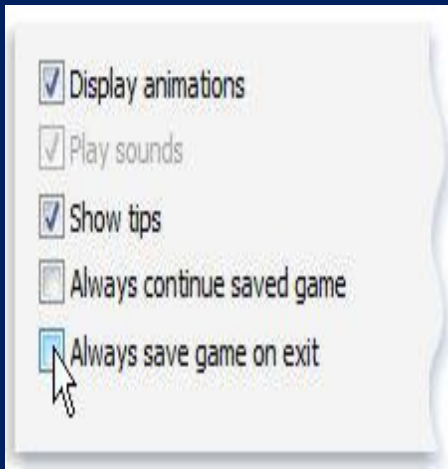
Figure10z. Shown check box

Practice 28
To use check boxes

   i.   Click an empty square to select or "turn on" that option. A check mark will appear in the square, indicating that the option is selected.

  ii.   To turn off an option, clear (remove) its check mark by clicking it.

 iii.   Options that currently can't be selected or cleared are shown in gray.

10.7.6 Sliders

A slider lets you adjust a setting along a range of values. It looks like this.
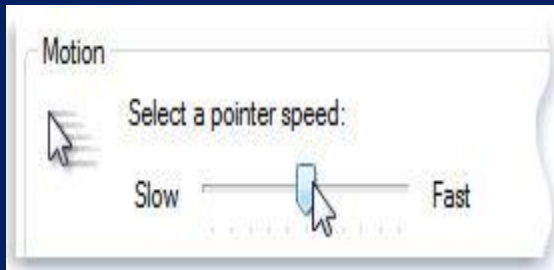
Figure10za. Slider

A slider along the bar shows the currently selected value. In the example shown above, the slider is positioned midway between Slow and Fast, indicating a medium pointer speed. To use a slider, drag the slider toward the value that you want.

10.7.7 Boxes

A text box allows you to type information, such as a search term or password. The figure 10zb shows a dialog box containing a text box. We've entered "bear" into the text box.
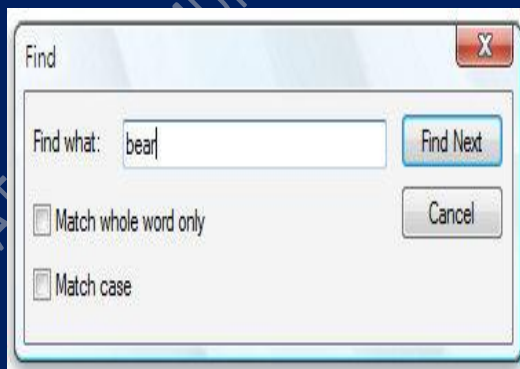

Figure10zb. Text box in a dialog box

A blinking vertical line called the cursor indicates where text that you type will appear. In the example, you can see the cursor after the

"r" in "bear." You can easily move the cursor by clicking the new position. For example, to add a word before "bear," you would first move the cursor by clicking before the "b."

If you don't see a cursor in the text box, it means the text box isn't ready for your input. Click the box first, and then start typing. Text boxes that require you to enter a password will usually hide your password as you type it, in case someone else is looking at your screen. See figure 10zc.
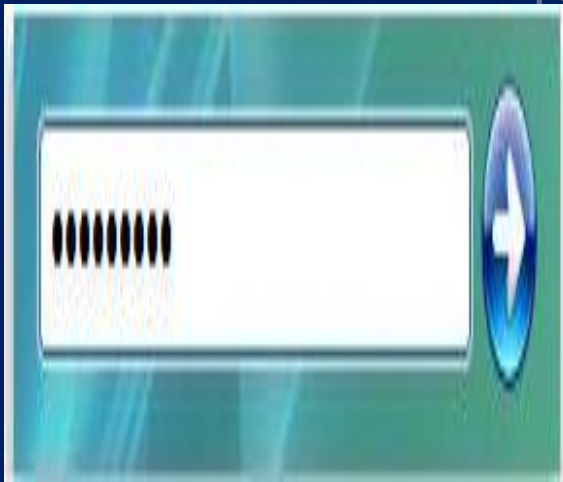

Figure10zc. Text boxes for passwords

10.7.8 Drop-Down Lists

Drop-down lists are similar to menus. Instead of clicking a command, though, you choose an option. When closed, a drop-down list shows only the currently selected option. The other available options are hidden until you click the control, as shown below in figure 10zc.
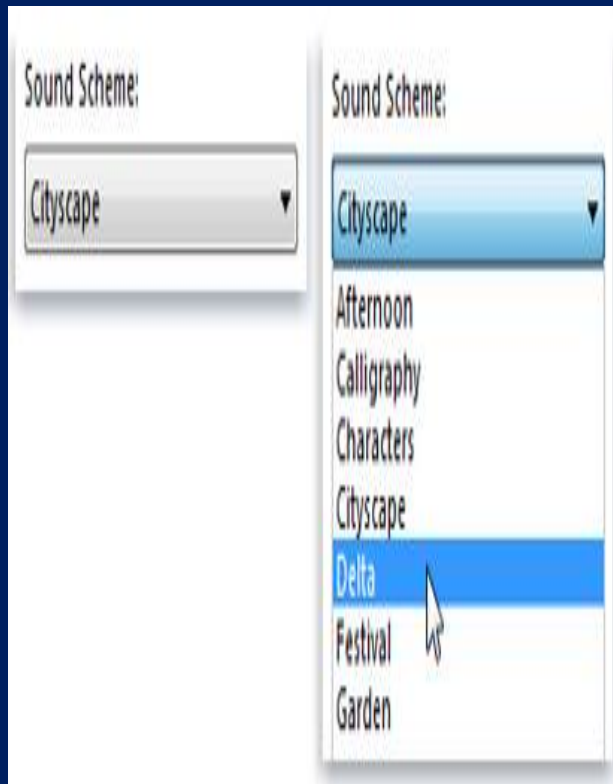
Figure 10zc. A drop-down list shown closed (left), and open (right)

10.7.9 List Boxes

A list box displays a list of options that you can choose from. Unlike a drop-down list, some or all of the options are visible without having to open the list see figure 10zc.

Figure10zd. List box
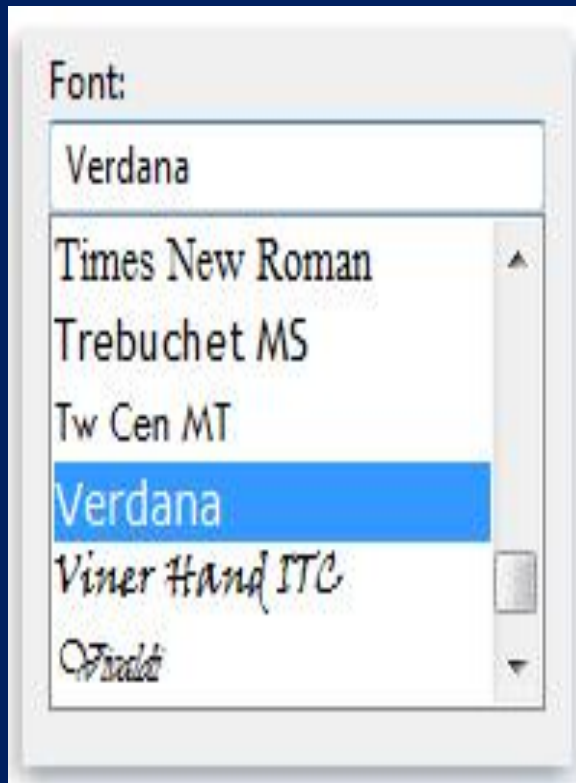
To choose an option from the list, click it. If the option you want isn't visible, use the scroll bar to scroll the list up or down. If the list box has a text box above it, you can type the name or value of the option instead.

10.7.10 Tabs
In some dialog boxes, options are divided into two or more tabs. Only one tab, or set of options, can be viewed at a time. See figure 10ze.
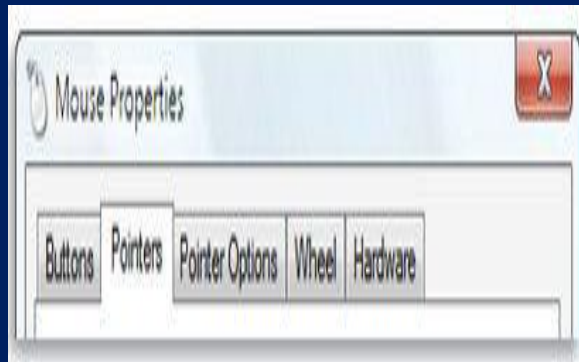
Figure10ze.   Tabs

The currently selected tab appears in front of the other tabs. To switch to a different tab, click the tab.

10.8   Programs

Almost everything you do on your computer requires using a program. For example, if you want to draw a picture, you need to use a drawing or painting program. To write a letter, you use a word processing program. To explore the Internet, you use a program called a web browser. Thousands of programs are available for Windows.

Practice 29
Opening a Program

The Start menu is the gateway to all of the programs on your computer. To open the Start menu, click the Start button🌐. The left pane of the Start menu contains a small list of programs, including your Internet browser, e-mail program, and recently used programs. To open a program, click it.

If you don't see the program you want to open, but you know its name, type all or part of the name into the search box at the bottom

of the left pane. Under Programs, click a program to open it. To browse a complete list of your programs, click the Start button, and then click All Programs.

You can also open a program by opening a file. Opening the file automatically opens the program associated with the file.

Practice 30
Creating a New Document

Many programs allow you to create, edit, save, and print documents. In general, a document is any type of file that you can edit. For example, a word processing file is a type of document, as is a spreadsheet, an e-mail message, and a presentation. However, the terms document and file are often used interchangeably; pictures, music clips, and videos that you can edit are usually called files, even though they are technically documents. Some programs, including WordPad, Notepad, and Paint, open a blank, untitled document automatically when you open the program, so that you can start working right away. You'll see a large white area and a generic word like "Untitled" or "Document" in the program's title bar.

If your program doesn't open a new document automatically when it opens, you can do it yourself:

- Click the File menu in the program you are using, and then click   New.   or Click the menu button [■▼], and then click New. If you can open more than one type of document in the program, you might also need to select the type from a list.

10.8.1 Saving a Document

As you work on a document, your additions and changes are stored in your computer's random access memory (RAM). Storage of information in RAM is temporary; if your computer is turned off or loses power, any information in RAM is erased.

Saving a document allows you to name it and to store it permanently on your computer's hard disk. That way, the document is preserved even when your computer is turned off, and you can open it again later.

Practice 31
To Save a Document
i.   Click the File menu, and click Save. Or Click the Save button .
ii.   If this is the first time you are saving the document, you'll be asked to provide a name for it and a location on your computer to save it to.

Even if you've saved a document once, you need to keep saving it as you work. That's because any changes you've made since you last saved the document are stored in RAM, not on the hard disk. To avoid losing work unexpectedly due to a power failure or other problem, save your document every few minutes.

Practice 32
Moving Information between Files

Most programs allow you to share text and images between them. When you copy information, it goes into a temporary storage area called the Clipboard. From there, you can paste it into a document.

Before you start moving information around, you should understand how to switch between the open windows on your desktop.

10.8.2 Undo Your Last Action

Most programs allow you to undo (reverse) actions you take or mistakes you make. For example, if you delete a paragraph in a WordPad document accidentally, you can get it back by using the Undo command. If you draw a line in Paint that you don't want, undo your line right away and it vanishes.

Practice 33
To Undo an Action
Click the Edit menu, and click Undo. orv
Click the Undo button 🔄.

10.8.3 Getting Help with a Program

Almost every program comes with its own built-in Help system for those times when you're confused about how the program works.
To access a program's Help system:

Practice 34

Click the Help menu and then click the first item in the list, such as "View Help," "Help Topics," or similar text. (The name of this item will vary.)
or
Click the Help button ❓.

You can also access a program's Help system by pressing F1. This function key opens Help in almost any program. In addition to program-specific help, some dialog boxes contain links to help about their specific functions. If you see a question mark inside a circle or square, or a colored and underlined text link, click it to open the Help topic. See figure 10zf.
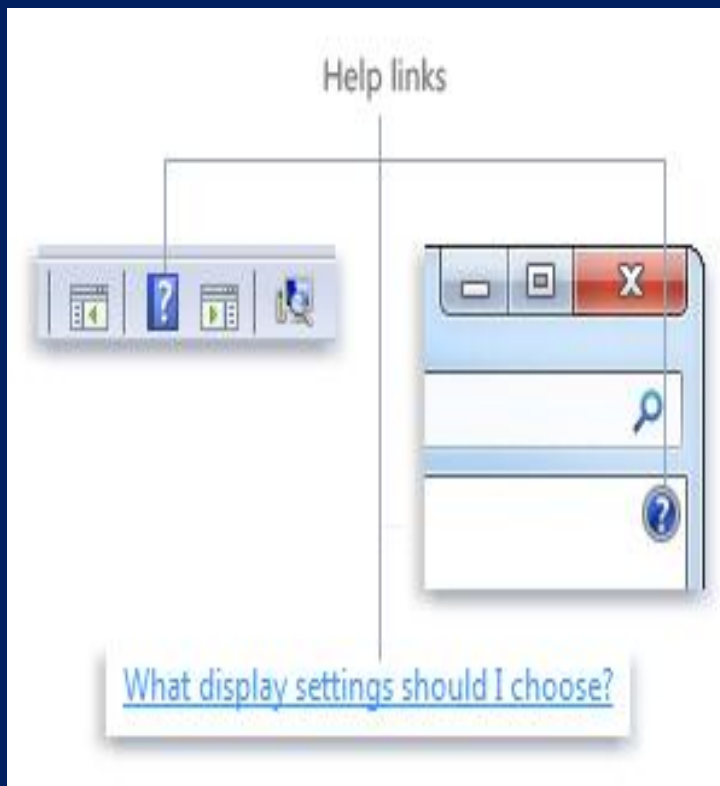
Figure10zf. Help links

Practice 35
Exiting a Program

To exit a program, click the Close button [X] in the upper-right corner of the program window. Or, click the File menu, and click Exit.

Remember to save your document before exiting a program. If you have unsaved work and try to exit the program, the program will ask you whether you want to save the document.

10.8.4 Installing or Uninstalling Programs

You're not limited to using the programs that come with your computer you can buy new programs on CD or DVD or download programs (either free or for a fee) from the Internet. Installing a program means adding it to your computer. After a program is installed, it appears in your Start menu in the All Programs list. Some programs might also add a shortcut to your desktop.

10.9   Files and Folders

A file is an item that contains information for example, text or images or music. When opened, a file can look very much like a text document or a picture that you might find on someone's desk or in a filing cabinet. On your computer, files are represented with icons; this makes it easy to recognize a type of file by looking at its icon.

A folder is a container you can use to store files in. If you had thousands of paper files on your desk, it would be nearly impossible to find any particular file when you needed it. That's why people often store paper files in folders inside a filing cabinet. On your computer, folders work the same way. Here are some typical folder icons figures 10zg.
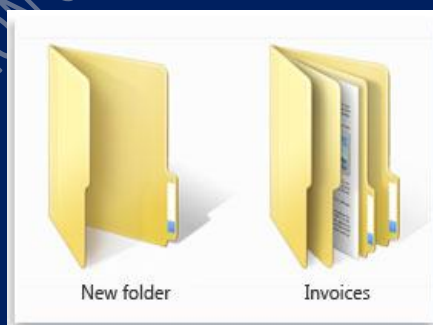

Figure10zg. An empty folder (left);
a folder containing files (right)

Folders can also store other folders. A folder within a folder is usually called a subfolder. You can create any number of subfolders, and each can hold any number of files and additional subfolders.

10.9.1 Using Libraries to Access Files and Folders

When it comes to getting organized, you don't need to start from scratch. You can use libraries, a feature new to this version of Windows, to access your files and folders, and arrange them in different ways. Here's a list of the four default libraries and what they're typically used for:

i. **Documents library**. Use this library to organize and arrange word-processing documents, spreadsheets, presentations, and other text-related files. By default, files that you move, copy, or save to the Documents library are stored in the My Documents folder.

ii. **Pictures library**. Use this library to organize and arrange your digital pictures, whether you get them from your camera, scanner, or in e-mail from other people.
By default, files that you move, copy, or save to the Pictures library are stored in the My Pictures folder.

iii. **Music library**. Use this library to organize and arrange your digital music, such as songs that you rip from an audio CD or that you download from the Internet. By default, files that you move, copy, or save to the Music library are stored in the My Music folder.

iv. **Videos library**. Use this library to organize and arrange your videos, such as clips from your digital camera or camcorder, or video files that you download from the Internet. By default, files that you move, copy, or save to the Videos library are stored in the My Videos folder.

Practice 36
Viewing and Arranging Files and Folders
When you open a folder or library, you can change how the files look in the window. For example, you might prefer larger (or smaller) icons or a view that lets you see different kinds of information about each file. To make these kinds of changes, use the Views button ⊞ ▾ in the toolbar.

Each time you click the left side of the Views button, it changes the way your files and folders are displayed by cycling through five different views: Large Icons, List, a view called Details that shows several columns of information about the file, a smaller icon view called Tiles, and a view called Content that shows some of the content from within the file.

If you click the arrow on the right side of the Views button, you have more choices. Move the slider up or down to fine-tune the size of the file and folder icons. You can see the icons change size as you move the slider. See figure 10zh.
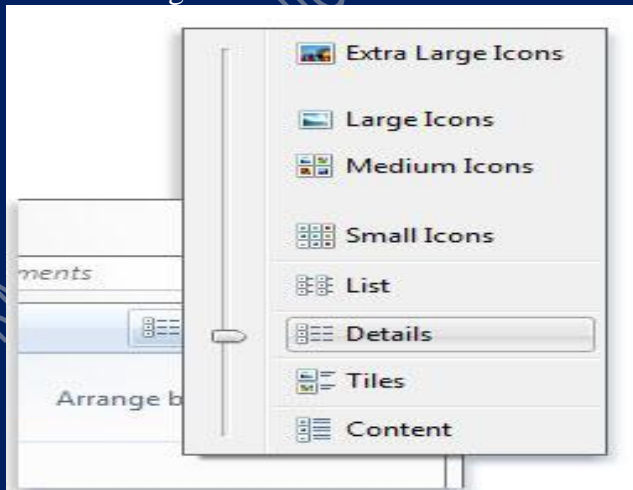

Figure10zh.   The Views options

In libraries, you can go a step further by arranging your files in different ways. For example, assuming you want to arrange the files in your Music library by genre.

1. Click the Start button , and then click Music.
2. In the library pane (above the file list), click the menu next to Arrange by, and then click Genre.

Practice 37
Finding Files
Depending on how many files you have and how they are organized, finding a file might mean browsing through hundreds of files and subfolders not an easy task. To save time and effort, use the search box to find your file.

The search box is located at the top of every window and also at the bottom edge of start button. To find a file, open the folder or library that makes the most sense as a starting point for your search, click the search box, and start typing. The search box filters the current view based on the text that you type. Files are displayed as search results if your search term matches the file's name, tags or other properties, or even the text inside a text document.

If you're searching for a file based on a property (such as the file's type), you can narrow the search before you start typing by clicking the search box, and then clicking one of the properties just below the search box. This adds a search filter (such as "type") to your search text, which will give you more accurate results.

If you aren't seeing the file you're looking for, you can change the entire scope of a search by clicking one of the options at the bottom of the search results. For example, if you search for a file in the Documents library but you can't find it, you can click Libraries to expand the search to the rest of your libraries.

Practice 38
Copying and Moving Files and Folders

Occasionally, you might want to change where files are stored on your computer. You might want to move files to a different folder, for example, or copy them to removable media (such as CDs or memory cards) to share with another person.

Most people copy and move files using a method called drag and drop. Start by opening the folder that contains the file or folder you want to move. Then, open the folder where you want to move it to in a different window. Position the windows side by side on the desktop so that you can see the contents of both.

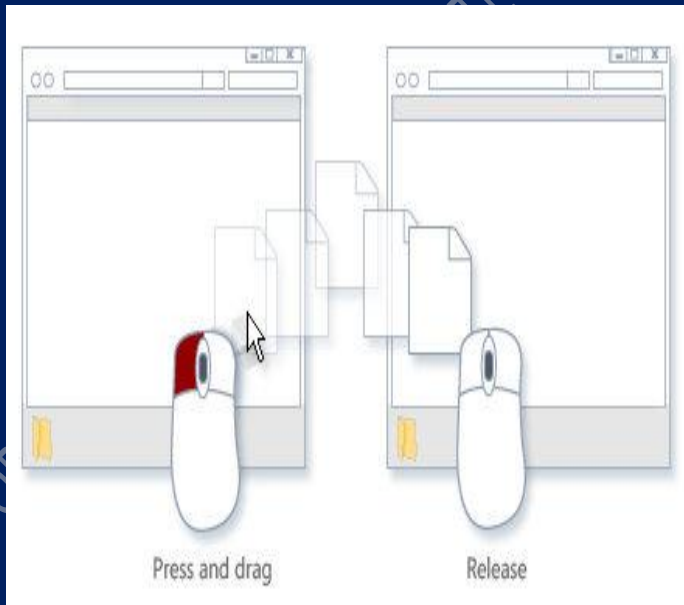Next, drag the file or folder from the first folder to the second folder. See figure 10zi.

Figure10zi. To copy or move a file,
by drag it from one window to another

When using the drag-and-drop method, you might notice that sometimes the file or folder is copied, and at other times it's moved. If you're dragging an item between two folders that are stored on the same hard disk, then the item is moved so that two copies of the same file or folder aren't created in the same location. If you drag the item to a folder that's in a different location (such as a network location) or to removable media like a CD, then the item is copied.

Practice 39
Creating and Deleting Files
The most common way to create new files is by using a program. For example, you can create a text document in a word-processing program or a movie file in a video-editing program. Some programs create a file as soon as you open them. When you open WordPad, for example, it starts with a blank page. This represents an empty (and unsaved) file. Start typing, and when you are ready to save your work, click the Save button. In the dialog box that appears, type a file name that will help you find the file again in the future, and then click Save.

By default, most programs save files in common folders like My Documents and My Pictures, which makes it easy to find the files again next time.

When you no longer need a file, you can remove it from your computer to save space and to keep your computer from getting cluttered with unwanted files.

To delete a file, open the folder or library that contains the file, and then select the file. Press Delete on your keyboard and then, in the Delete File dialog box, click Yes.

When you delete a file, it's temporarily stored in the Recycle Bin. Think of the **Recycle Bin** as a safety net that allows you to recover files or folders that you might have accidentally deleted. Occasionally, you should empty the Recycle Bin to reclaim all of the hard disk space being used by your unwanted files.

Practice 40
Opening an Existing File
To open a file, double click it. The file will usually open in the program that you used to create or change it. For example, a text file will open in your word-processing program.

That's not always the case, though. Double-clicking a picture file, for example, will usually open a picture viewer. To change the picture, you need to use a different program. Right-click the file, clicks Open with, and then clicks the name of the program that you want to use.

10.10   Printing
We can print almost anything with Windows: documents, pictures, webpages, or e-mail.

10.10.1   What's DPI?
DPI, or dots per inch, is a measure of a printer's resolution. DPI determines how crisp and detailed your document or picture will appear. It's an important consideration when buying a new printer.

Practice 41
Connecting Your Printer
Printers are designed to connect to a computer running Windows in different ways, depending on the model and whether you're using it at home or work. Here are the most common connections you'll encounter:

Wired printers
These devices connect using a cable and a port on the computer. Most home printers have a universal serial bus (USB) connector, although some older models might connect to the parallel or serial ports. On a typical PC, the parallel port is often marked "LPT1" or with a tiny printer-shaped icon.

When you plug in a USB printer, Windows automatically attempts to identify it and install the software (called a driver) needed to make it work with your PC.

Windows is designed to automatically recognize hundreds of printers. However, you should always consult the instructions that came with your printer; with some printers, you'll need to install the manufacturer's software before you plug it in.

If your printer is older or doesn't use USB, you might have to install it manually.

Wireless Printers

A wireless printer connects to a computer using radio waves by using either Bluetooth or Wi-Fi technology.

To connect a Bluetooth printer, you might need to need to add a Bluetooth adapter to your computer. Most Bluetooth adapters plug into a USB port.

When you plug in the adapter and turn on the Bluetooth printer, Windows will try to install it automatically, or prompt you to install it. If Windows can't detect the printer, you can add it manually.

A Wi-Fi printer typically connects directly to a wireless network as a stand-alone device.

Local Vs. Network Printers

A printer that connects directly to a PC is called a local printer. One that connects directly to a network as a stand-alone device is called, perhaps not surprisingly, a network printer. Network printers are most often found at the office although that's quickly changing. A growing number of printer companies now make models with networking capability for the home. These printers typically connect to a network with an Ethernet cable or wireless technologies such as Wi-Fi or Bluetooth.

Practice 42
Printing in Windows
Windows offers multiple ways to print. The method you choose depends on what you're trying to print. Here's a list of common printing tasks.

i.   Print a document or e-mail.
ii.   Print your photos.
iii.   Print the computer screen.

Choosing Print Options
Double-sided or single-sided. Monochrome or color. Landscape or portrait orientation. These are just some of the choices you'll have to make when you print. Most options are located in the Print dialog box, which you can access from the File menu in most programs. See figure 10zj.
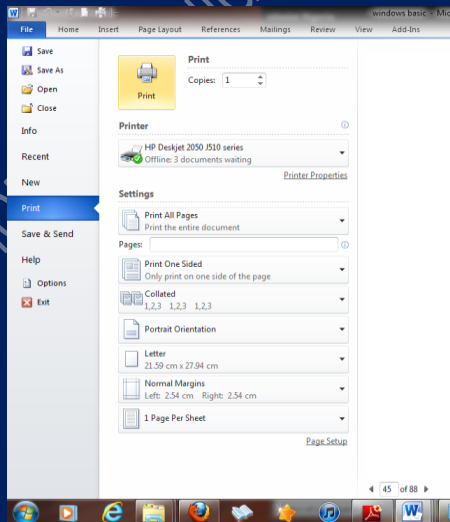
Figure10zj. The Print dialog box in MS Word 2010

What options you have available and how you select them in Windows depend on the printer model and program you're using. For specifics, check the documentation that came with your printer or software application. (To access some options, you might need to click a "Preferences," "Properties," or "Advanced Options" link or button within the Print dialog box.)

Here are the most common print options you'll encounter and what they mean:

i.   Printer selection. The list of available printers. Sometimes you can also choose to send documents as a fax, or save them as an XPS document.
ii. Page range. Use commas or hyphens to select specific pages or a range of pages. For example, typing 1, 4, 20-23 prints pages 1, 4, 20, 21, 22, and 23.
     The Selection option prints only the selected text or graphics in a document. Current Page prints only the currently displayed page.
iii. Number of copies. Print more than one copy of a document, picture, or file. Select the Collate check box to print a document in its entirety before moving to the next copy.
iv. Page orientation. Also called page layout. Choose between a tall page (Portrait) or wide page (Landscape).
v.   Paper size. Select different size paper.
vi. Output or paper source. Also called output destination or paper tray. Choose a paper tray to use—handy especially if you load each tray with different sizes of paper.
vii. Double-sided printing. Also called duplex or two-sided printing. Choose this to print on both sides of a sheet.
viii. Print color. Choose between black-and-white and color prints.

Managing Documents Waiting to be printed

When you print something, it goes to the print queue, where you can view, pause, or cancel printing, and carry out other management tasks. The print queue shows you what's printing or waiting to print. It also displays handy information such as print status, who's printing what, and how many pages remain.
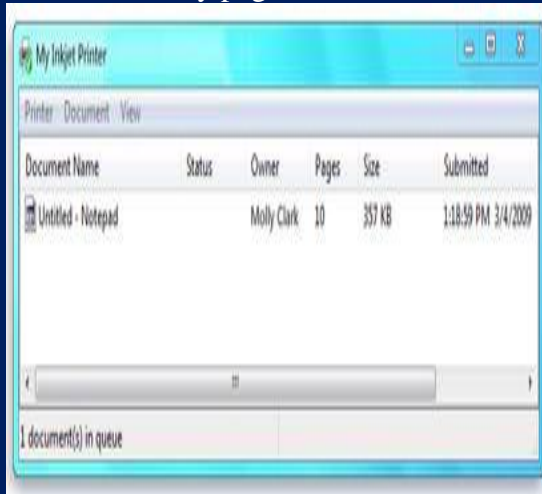
Figure 10zk.The print queue

Practice 42

Solving Printing Problems

As with any technology, sometimes printers don't always do what you expect. If your model doesn't work when you plug it into your PC, or your printed pages start to look faded or funny, you'll have to figure out what's wrong.

Solving the problem might be as simple as replacing the toner cartridge. Other times, you might have to download and install a new driver. Either way, the best source for assistance is the manual that came with your printer or the manufacturer's website.

10.11   Using Email

E-mail (short for electronic mail) is a fast and convenient way to communicate with others. You can use e-mail to:

i.   Send and receive messages. You can send an e-mail message to any person with an e-mail address. The message arrives in the recipient's e-mail inbox within seconds or minutes—despite whether he or she is your next-door neighbor or lives halfway around the world. You can receive messages from anyone who knows your e-mail address, and then read and reply to those messages.

ii.   Send and receive files. In addition to typical text-based e-mail messages, you can send almost any type of file in an e-mail message, including documents, pictures, and music. A file sent in an e-mail message is called an attachment.

iii.   Send messages to groups of people. You can send an e-mail message to many people simultaneously. Recipients can reply to the whole group, allowing for group discussions.

iv.   Forward messages. When you receive an e-mail message, you can forward it to others without retyping it.

10.11.1   What Do I Need Before I can Use E-Mail

To use e-mail, you need three things:

i.   An Internet connection. To connect your computer to the Internet, you must first sign up with an Internet service provider (ISP). An ISP provides you with access to the Internet, usually for a monthly fee. You also need a modem.

ii.   An e-mail program or web-based e-mail service. You can download or purchase e-mail programs from Microsoft or another provider. E-mail programs often have more features and are faster to search than most web-based e-mail services. Before you set up an e-mail program, you'll need to get some information from your ISP: usually your e-mail address,

password, the names of your incoming and outgoing e-mail servers, and certain other details.

If you don't want to download or purchase an e-mail program, you can instead sign up with a free web-based e-mail service, such as Gmail, Windows Live Hotmail, or Yahoo! Mail. These services allow you to check your e-mail with a web browser from any computer connected to the Internet.

iii.   An e-mail address. You get an e-mail address from your ISP or web-based e-mail service when you sign up. An e-mail address consists of a user name (a nickname you choose, not necessarily your real name), the @ sign, and the name of your ISP or web-based e-mail provider—for example, asafe2012@gmail.com

Practice 43
Creating and Sending E-Mail Messages

Figure 10zj shows how to fill the message window in most e-mail programs. These steps may vary, depending on what e-mail program or web-based service you are using:

i.   In the To box, type the e-mail address of at least one recipient. If you're sending the message to multiple recipients, type a semicolon (;) between e-mail addresses. In the Cc box, you can type the e-mail addresses of any secondary recipients

ii.   In the Subject box, type a title for your message.

iii.   In the large blank area, type your message.

To attach a file to the message, click the Attach File button 📎 on the toolbar (located just below the menu bar). Locate the file, select it, and then click Open. The file now appears in the Attach box in the message header.
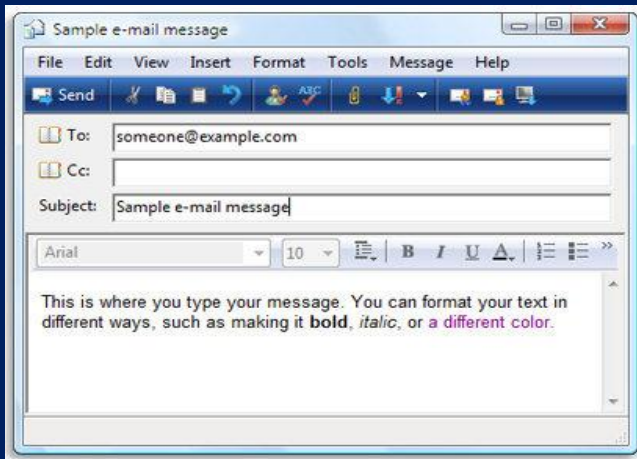
Figure10zl. Sample e-mail message

To change the style, font, size, or color of the text, select the text, and then click one of the buttons or menu items that allow you to change the text formatting.

Practice 44
Reading and Replying E-Mail Messages

Most e-mail programs and web-based e-mail services have an inbox where you can read messages you have received. You might have to click a button labeled Send/Receive, or something similar, to receive new messages. To see a list of e-mail messages you've received, click Inbox in the Folders list of your e-mail program. Your e-mail messages should appear in the message list. The list typically shows who sent the mail, the subject, and when it was received.

To read a message, click it in the message list. The contents of the message might appear below the message list in the preview pane. If so, double-click it in the message list to read the message in a separate window. See figure 11zk. To reply to a message, click the Reply button.
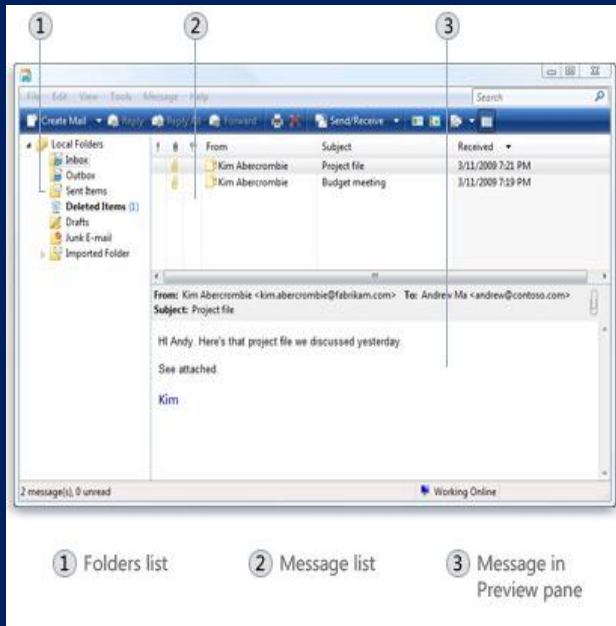
Figure10zm. Click the inbox to see your e-mail messages

10.11.2   E-mail etiquette

Like telephone and face-to-face conversations, e-mail communication has certain implied rules of behavior. These rules are referred to as e-mail etiquette or netiquette (a combination of the terms Internet and etiquette). For effective communication, follow these guidelines:

i.   Be careful with humor and emotion. E-mail doesn't convey emotion well, so the recipient might not understand your intended tone. Sarcastic humor is particularly risky because the recipient might interpret it literally and take offense. To convey emotion, consider using emoticons (see "Using emoticons" in this article below).

ii. Think before you send. Writing and sending an e-mail message is fast and easy—sometimes too easy. Make sure you've thought out your message first, and avoid writing when you're angry.

iii. Use a clear and concise subject line. Summarize the contents of the message in a few words. People who receive a large amount of e-mail can use the subject to prioritize the message.

iv. Keep messages short. Although an e-mail message can be of any length, e-mail is designed for quick communication. Many people don't have the time or patience to read more than a few paragraphs.

v. Avoid using ALL CAPITAL LETTERS. Many people perceive sentences written in all uppercase letters as yelling and might find it annoying or offensive.

vi. Be careful with sensitive or confidential information. Any recipient can forward your message to others—either intentionally or accidentally.

Practice 45
Using emoticons

It's often difficult to convey emotion, intent, or tone through text alone, early Internet users invented emoticons (a combination of the terms emotion and icons) sequences of keyboard characters that symbolize facial expressions. For example, :) looks like a smiling face when you look at it sideways. Below are some examples of emoticons.

Emoticon Meaning

:) or :-)   Smiling, happy, or joking

:(or :-(Frowning or unhappy

;-)   Winking

:-| Indifferent or ambivalent

Emoticon	Meaning
:-o	Surprised or concerned
:-x	Not saying anything
:-p	Sticking out your tongue (usually in fun)
:-D	Laughing

10.11.3   Dealing with Junk E-Mail

We can receive unsolicited advertisements, flyers, and catalogs in your regular mail, you'll probably receive junk e-mail (often called spam) in your inbox. Junk e-mail might include advertisements, fraudulent schemes, pornography, or legitimate offers. Because it's very inexpensive for marketers to send junk e-mail, it's not uncommon for people to receive a large amount of it.

Many e-mail programs and web-based e-mail services include a junk filter, also called a spam filter. These analyze the content of messages sent to you and move suspicious messages to a special junk e-mail folder, where you can view or delete them at any time. If a junk e-mail message slips past the filter into your inbox, many e-mail programs allow you to specify that any future messages from that sender be automatically moved to the junk e-mail folder.

Prevention of Junk E-Mail:

i.   Use caution in giving out your e-mail address. Avoid publishing your real e-mail address in newsgroups, on websites, or in other public areas of the Internet.

ii.   Before you give your e-mail address to a website, check the site's privacy statement to be sure it doesn't permit the disclosure of your e-mail address to other companies.

iii. Never reply to a junk e-mail message. The sender will know that your e-mail address is valid and might sell it to other companies. You're then likely to receive even more junk e-mail.

10.12 Understanding Security and Safer Computing

If you connect to the Internet, allow other people to use your computer, or share files with others, you should take steps to protect your computer from harm. Because there are computer criminals (sometimes called hackers) who attack other people's computers. These people can attack directly, by breaking into your computer through the Internet and stealing your personal information, or indirectly, by creating malicious software to harm your computer.

Fortunately, you can help protect yourself by taking a few simple precautions.

Practice 46
Protect Computer against Security Threat

These are ways to help protect your computer against potential security threats:

i.   Firewall. A firewall can help protect your computer by preventing hackers or malicious software from gaining access to it.
ii.   Virus protection. Antivirus software can help protect your computer against viruses, worms, and other security threats.
iii. Spyware and other malware protection. Antispyware software can help protect your computer from spyware and other potentially unwanted software.
iv.   Windows Update. Windows can routinely check for updates for your computer and install them automatically.
v.   Install latest version of web browser
vi.   Turn on your browser security features
vii. Using standard users account

Use a firewall

A firewall is software or hardware that checks information coming from the Internet or a network and then either turns it away or allows it to pass through to your computer, depending on your firewall settings. In this way, a firewall can help prevent hackers and malicious software from gaining access to your computer. Windows Firewall is built into Windows and is turned on automatically. Figure 10zl shows how firewall work.
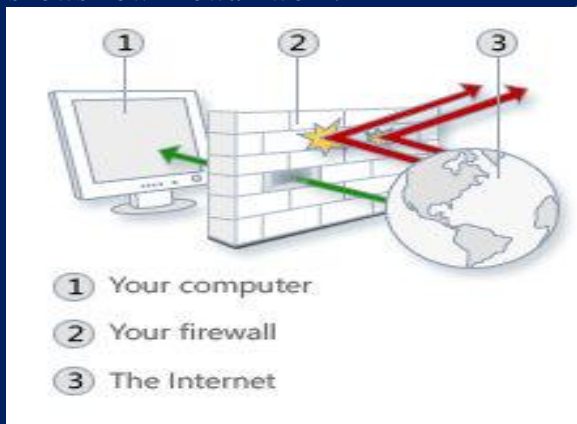
Figure 11mn .How a firewall works

If you run a program such as an instant messaging program or a multiplayer network game that needs to receive information from the Internet or a network, the firewall asks if you want to block or unblock (allow) the connection. If you choose to unblock the connection, Windows Firewall creates an exception so that the firewall won't bother you when that program needs to receive information in the future.

Use Virus Protection

Viruses, worms, and Trojan horses are programs created by hackers that use the Internet to infect vulnerable computers. Viruses and

worms can replicate themselves from computer to computer, while Trojan horses enter a computer by hiding inside an apparently legitimate program, such as a screen saver. Destructive viruses, worms, and Trojan horses can erase information from your hard disk or completely disable your computer. Others don't cause direct damage, but worsen your computer's performance and stability.

Antivirus programs scan e-mail and other files on your computer for viruses, worms, and Trojan horses. If one is found, the antivirus program either quarantines (isolates) it or deletes it entirely before it damages your computer and files.

Windows does not have a built-in antivirus program, but your computer manufacturer might have installed one. If not, there are many antivirus programs available. Microsoft offers Microsoft Security Essentials, a free antivirus program you can download from the Microsoft Security Essentials website. You can also go to the Windows 7 security software provider's website to find a third-party antivirus program.

Because new viruses are identified every day, it's important to use an antivirus program with an automatic update capability. When the program is updated, it adds new viruses to its list of viruses to check for, helping to protect your computer from new attacks. If the list of viruses is out of date, your computer is vulnerable to new threats. Updates usually require an annual subscription fee. Keep the subscription current to receive regular updates.

Use Spyware Protection

Spyware is software that can display advertisements, collect information about you, or change settings on your computer, generally without appropriately obtaining your consent. For example, spyware can install unwanted toolbars, links, or favorites in your web browser, change your default home page, or display pop-up ads frequently. Some spyware displays no symptoms that you can detect, but it secretly collects sensitive information, such as

the websites you visit or the text you type. Most spyware is installed through free software that you download, but in some cases simply visiting a website results in a spyware infection.

To help protect your computer from spyware, use an antispyware program. This version of Windows has a built-in antispyware program called **Windows Defender**, which is turned on by default. Windows Defender alerts you when spyware tries to install itself on your computer. It also can scan your computer for existing spyware and then remove it.

Because new spyware appears every day, Windows Defender must be regularly updated to detect and guard against the latest spyware threats. Windows Defender is updated as needed whenever you update Windows. For the highest level of protection, set Windows to install updates automatically.

Update Windows Automatically

Microsoft regularly offers important updates to Windows that can help protect your computer against new viruses and other security threats. To ensure that you receive these updates as quickly as possible, turn on automatic updating. That way, you don't have to worry that critical fixes for Windows might be missing from your computer.

Updates are downloaded behind the scenes when you're connected to the Internet. The updates are installed at 3:00 A.M. unless you specify a different time. If you turn off your computer before then, you can install updates before shutting down. Otherwise, Windows will install them the next time you start your computer.

Turn on Automatic Updating

i.   Open Windows Update by clicking the Start button . In the search box, type Update, and then, in the list of results, click Windows Update.

ii.   Click Change settings.

iii.   Make sure Install updates automatically (recommended) is selected.
Windows will install important updates for your computer as they become available. Important updates provide significant benefits, such as improved security and reliability.

iv.   Under Recommended updates, make sure the Give me recommended updates the same way I receive important updates check box is selected, and then click OK.
Recommended updates can address non-critical problems and help enhance your computing experience. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

Install the Latest Version of Web Browser and Keep It Up To Date

Using the latest version of your web browser and keeping your browser up to date are two of the best ways to prevent trouble online. In most cases, the latest version of a web browser contains security fixes and new features that can help protect your computer and your privacy while you're online.

Also, many web browsers offer security updates periodically. So be sure to install updates for your browser whenever they're available.

If you have Internet Explorer, you can get updates for it automatically using Windows Update. If your computer isn't set up to automatically receive updates, you can manually request these updates by using Internet Explorer. Click the Safety button, and then click Windows Update.

Turn On Your Browser's Security Features

Many web browsers have security features that help you browse the web safely. So it's a good idea to find out what security features your browser has and make sure they're enabled.

If you have Internet Explorer, here are some of the security features that are available:

i. Smart Screen Filter, which can help protect you from online phishing attacks, fraud, and spoofed or malicious websites.

ii. Domain highlighting, which lets you more easily see the real web address on websites you visit. This helps you avoid deceptive or phishing websites that use misleading web addresses to trick you. The true domain you're visiting is highlighted in the address bar.

iii. Manage Add-ons, which lets you disable or allow web browser add-ons and delete unwanted ActiveX controls.

iv. Cross site scripting (XSS) filter, which can help prevent attacks from phishing and fraudulent websites that might attempt to steal your personal and financial information?

v. A 128-bit secure (SSL) connection for using secure websites. This helps Internet Explorer create an encrypted connection with websites run by banks, online stores, medical sites, or other organizations that handle sensitive customer information.

Use a Standard User Account
When you log on to your computer, Windows grants you a certain level of rights and privileges depending on what kind of user account you have. There are three different types of user accounts:

i. Standard
ii. Administrator
iii. Guest

Although an administrator account provides complete control over a computer, using a standard account can help make your computer more secure. That way, if other people (or hackers) gain access to your computer while you're logged on, they can't tamper with the

computer's security settings or change other user accounts. You can check your account type after you log on by doing the following:

10.12.1   Safely Using Of E-Mail and the Web

i.   Use caution when opening e-mail attachments. E-mail attachments (files attached to e-mail messages) are a primary source of virus infection. Never open an attachment from someone you don't know. If you know the sender but weren't expecting an attachment, verify that the sender actually sent the attachment before you open it.

ii.   Guard your personal information carefully. If a website asks for a credit card number, bank information, or other personal information, make sure you trust the website and verify that its transaction system is secure.

iii.   Be careful when clicking hyperlinks in e-mail messages. Hyperlinks (links that open websites when you click them) are often used as part of phishing and spyware scams, but they can also transmit viruses. Only click links in e-mail messages that you trust.

iv.   Only install add-ons from websites that you trust. Web browser add-ons allow webpages to display things like toolbars, stock tickers, video, and animation. However, add-ons can also install spyware or other malicious software. If a website asks you to install an add-on, make sure that you trust it before doing so.

10.13   Review Questions

1.   What is window desktop
2.   Identify any 5 default components of windows desktop
3.   Define windows operating system
4.   Compare application windows and windows desktop

5. Named and give function of any 5 default windows desktop components
6. Define screen saver and highlights the steps involve selecting screensaver for your system
7. Describe the steps involve to convert your pictures to window desktop
8. Compare file, folder and drives
9. Define Icons, Menus, selection, clipboard and Shortcut
10. Compare Checkboxes, Sliders and Spinner
11. Describe any 5 component of start menu right pane
12. Describe the function of search box
13. Describe the procedure to customize start menu
14. Describe the procedure to adjust the number of shortcuts for frequently used programs
15. Describe the procedure to move desktop taskbar to top of desktop
16. Describe briefly desktop gadget, and identify 5 gadgets that come with Windows 7
17. Why desktop gadget
18. Describe the procedure to see which gadgets are installed on your computer
19. Describe briefly program windows, and identify components that are common to atypical window
20. Describe switching the windows with AERO FLIP 3D
21. Describe 3 ways of arranging windows on desktop
22. Describe the procedure to arrange windows side by side with SNAP
23. Describe the use of dialog box, and identify any 5 operation/command that could invoke dialog box when working on window.
24. Describe 4 default library in window 7
25. What is the advantages of email over the telephone or regular mail

26. What are 3 major things needed to use email
27. What is the basic advantage of emoticon? Hence give any 5 emoticons and their meaning.
28. Why window update. Describe procedure to turn on window update
29. Describe different types of user account on window 7

Chapter Eleven
Word Processing Packages

11.1 Description Of Word Processing Packages

Computer application program that we use to create, edit, and print documents is refers to as word processing. Of all computer applications, word processing is the most common. To perform word processing, you need a computer, a special program called a word processor, and a printer. A word processor enables you to create a document, store it electronically on a disk, display it on a screen, modify it by entering commands and characters from the keyboard, and print it on a printer.

11.1.1   Word Processing Compared To Using A   Typewriter

The great advantage of word processing over using a typewriter is that you can make changes without retyping the entire document. If you make a typing mistake, you simply back up the cursor and correct your mistake. If you want to delete a paragraph, you simply remove it, without leaving a trace. It is equally easy to insert a word, sentence, or paragraph in the middle of a document. Word processors also make it easy to move sections of text from one place to another within a document, or between documents. When you have made all the changes you want, you can send the file to a printer to get a hard copy.

11.1.2   Word Processor Features

Word processors vary considerably, but all word processors support the following feature;

Basic Features
i.   Insert text: Allows you to insert text anywhere in the document.
ii. Delete text: Allows you to erase characters, words, lines, or pages as easily as you can cross them out on paper.
iii. Cut and paste: Allows you to remove (cut) a section of text from one place in a document and insert (paste) it somewhere else.
iv. Copy: Allows you to duplicate a section of text.
v.   Page size and margins: Allows you to define various page sizes and margins, and the word processor will automatically readjust the text so that it fits.
vi. Search and replace: Allows you to direct the word processor to search for a particular word or phrase. You can also direct the word processor to replace one group of characters with another everywhere that the first group appears.
vii. Word wrap: The word processor automatically moves to the next line when you have filled one line with text, and it will readjust text if you change the margins.
viii. Print: Allows you to send a document to a printer to get hardcopy.

Standard Features
Word processors that support only the basic features (and maybe a few others) are called text editors. Most word processors, however, support additional features that enable you to manipulate and format documents in more sophisticated ways. These more advanced word processors are sometimes called full-featured word processors. Full-featured word processors usually support the following features:

i. File management: Many word processors contain file management capabilities that allow you to create, delete, move, and search for files.

ii. Font specifications: Allows you to change fonts within a document. For example, you can specify bold, italics, and underlining. Most word processors also let you change the font size and even the typeface.

iii. Footnotes and cross-references: Automates the numbering and placement of footnotes and enables you to easily cross-reference other sections of the document.

iv. Graphics: Allows you to embed illustrations and graphs into a document. Some word processors let you create the illustrations within the word processor; others let you insert an illustration produced by a different program.

v. Headers, footers, and page numbering: Allows you to specify customized headers and footers that the word processor will put at the top and bottom of every page. The word processor automatically keeps track of page numbers so that the correct number appears on each page.

vi. Layout: Allows you to specify different margins within a single document and to specify various methods for indenting paragraphs.

vii. Macros: A macro is a character or word that represents a series of keystrokes. The keystrokes can represent text or commands. The ability to define macros allows you to save yourself a lot of time by replacing common combinations of keystrokes.

viii. Merges: Allows you to merge text from one file into another file. This is particularly useful for generating many files that have the same format but different data. Generating mailing labels is the classic example of using merges.

ix. Spell checker: A utility that allows you to check the spelling of words. It will highlight any words that it does not recognize.

x. Tables of contents and indexes: Allows you to automatically create a table of contents and index based on special codes that you insert in the document.

xi. Thesaurus: A built-in thesaurus that allows you to search for synonyms without leaving the word processor.

xii. Windows: Allows you to edit two or more documents at the same time. Each document appears in a separate window. This is particularly valuable when working on a large project that consists of several different files.

xiii. WYSIWYG (what you see is what you get): With WYSIWYG, a document appears on the display screen exactly as it will look when printed.

11.2 Area of Application of Word Processor Packages In Business Organization

Within the business world, word processors are extremely useful tools. Typical uses include:

i. Letters and letterhead: A letter is a written message containing information from one party to another. The role of letters in communication has changed significantly since the nineteenth century. Historically, letters (in paper form) were the only reliable means of communication between two people in different locations. A letterhead is the heading at the top of a sheet of letter paper (stationery). That heading usually consists of a name and an address, and a logo or corporate design, and sometimes a background pattern. The term "letterhead" is often used to refer to the whole sheet imprinted with such a heading. The majority of company letterheads are printed A4 in size (210mm x 297mm) although occasionally A5 (148mm x 210mm) and other

bespoke sizes are sometimes used. These letters and letterhead are been design with the use of Word processor packages

ii. Memorandum: A memorandum (abbrev. memo) was from the Latin verbal phrase memorandum est, the gerundive form of the verb memoro, "to mention, call to mind, recount, relate", which means "It must be remembered (that)...". It is therefore a note, document or other communication that helps the memory by recording events or observations on a topic, such as may be used in a business office. This memoro are been design with the use of Word processor.

iii. Distribution of Multiple Copies: Using a word processing program instead of plain old pencil and paper means you can easily distribute copies of your writing to others. While it's true that you can make photocopies of a hand-written document and physically give them out, using word processing software means your words can be transmitted to millions of people anywhere in the world with the touch of a button -- and no trees need to die for it.

iv. Everyone Can Read Your Writing: It's not just doctors who have handwriting that is challenging to read. Many people have less-than-perfect penmanship and could benefit greatly from doing their writing with a word processing program. Using word processing means your writing will always be readable. Word processing programs use clear, easy to read fonts and you can easily increase the size of your text to benefit those who may have trouble seeing clearly.

11.3 Word Processing With Microsoft Word 2010

11.3.1 Microsoft Word 2010 is a word-processing program, designed to help you create professional-quality documents. With the finest document-formatting tools, Word helps you organize and write your documents more efficiently. Word also includes powerful

editing and revising tools so that you can collaborate with others easily.

11.3.2 Identification Of Microsoft Word 2010 Components

All the components of the MS word 2010 are presents in it its window component or the graphical user interface shown below.
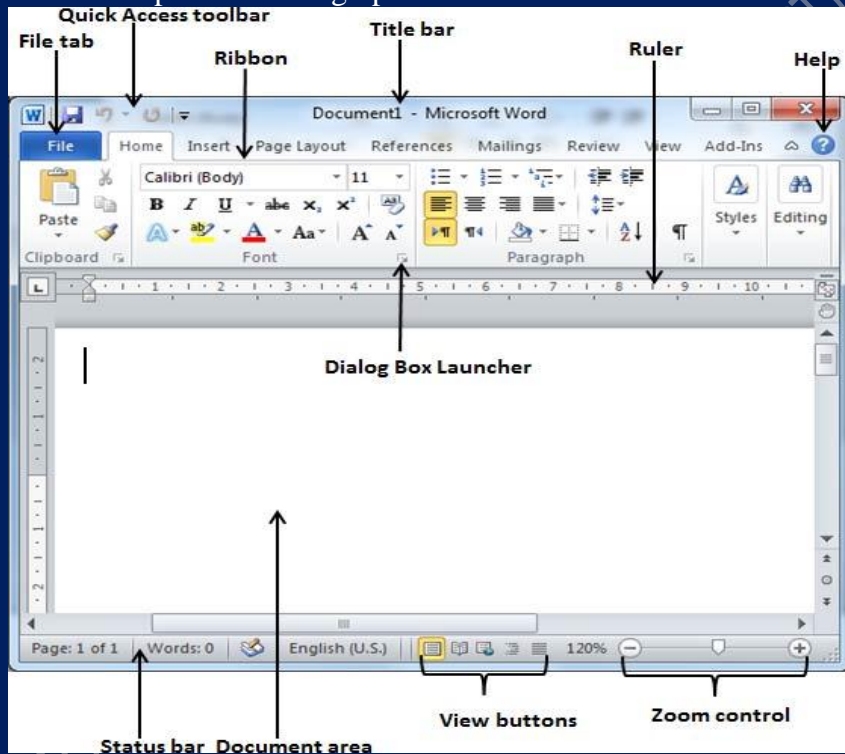
Figure 11a. MS Word 2010 GUI

The Ribbon

Understanding the Ribbon is a great way to help understand the changes between Microsoft 2003 to Microsoft 2010. The ribbon holds all of the information in previous versions of Microsoft Office in a more visual stream line manner through a series of tabs that

include an immense variety of program features. The ribbon is made up of collection of tabs as listed and discussed below.

Home Tab
This is the most used tab; it incorporates all text formatting features such as font and paragraph changes.

Figure 11b. Home tab

Insert Tab
This tab allows you to insert a variety of items into a document from pictures, clip art, tables and headers and footers.

Page Layout Tab
This tab has commands to adjust page elements such as margins, orientation, inserting columns, page backgrounds and themes.
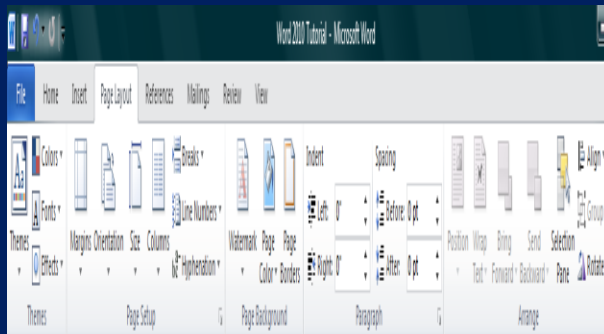
Figure 11d. Page layout tab

Reference Tab
This tab has commands to use when creating a Table of Contents and citation page for a paper. It provides you with many simple solutions to create these typically difficult to produce documents.
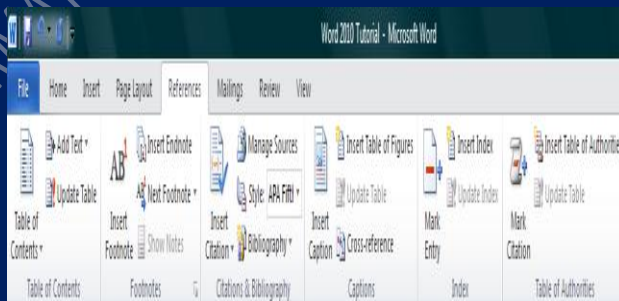
Mailing Tab

This tab allows you to create documents to help when sending out mailings such as printing envelopes, labels and processing mail merges.

Figure11f. Mailing tab

Review Tab

This tab allows you to make any changes to your document due to spelling and grammar issues. It also holds the track changes feature which provides people with the ability to make notes and changes to a document of another person.

Figure11f. Review tab

View Tab

This tab allows you to change the view of your document to a different two page document or zoom.

Figure 11g. View tab

Now that you have an understanding of where things are located, let's move further to romance with computer.

Practice 1

Opening Ms Word 2010

You may have a shortcut to Word on your desktop, if so double click the icon and Word will open. If not follow the steps below:

    i.   Click on the Start button

    ii.   Highlight Programs

    iii.   Highlight Microsoft Office

    iv.   Click on Microsoft Word 2010

Practice 2
Create a New Document
  i.   Click the **File** tab and then click **New**.
  ii.   Under **Available Templates**, click **Blank Document**.
  iii. Click **Create**.

Practice 3
Using Templates
Word 2010 allows you to apply built-in templates from a wide selection of popular Word templates, including resumes, agendas, business cards, and faxes. To find and apply a template in Word, do the following:

  i.   On the File tab, click New.
  ii.   Under Available Templates, do one of the following:
  iii. To use one of the built-in templates, click Sample Templates, click the template that you want, and then click Create.
  iv.   To reuse a template that you've recently used, click Recent Templates, click the template that you want, and then click Create.
  v.   To find a template on Office.com, under Office.com Templates, click the template category that you want, click the template that you want, and click Download to download the template from Office.com to your computer.
  vi.   Once you have selected your template you can modify it in any way to create the document you want.

Note: You can also search for templates on Office.com from within Word. In the Search Office.com for templates box, type one or more search terms, and then click the arrow button to search.

Practice 4
Opening A Document

i.   Click the **File** tab, and then click **Open**.
ii.   In the left pane of the **Open** dialog box, click the drive or folder that contains the document.
iii. In the right pane of the **Open** dialog box, open the folder that contains the document that you want.
iv.   Click the document and then click **Open**.

Practice 5
How To Insert Sample Text
To insert sample text in Word 2007 or Word 2010, use any of the following methods.

Method 1: Use rand()
To insert localized sample text in Word 2007 or Word 2010, type =rand() in the document where you want the text to appear, and then press ENTER. The sample text that is inserted for the English version of Word 2007 or Word 2010 resembles the following text:

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document. You can use these galleries to insert tables, headers, footers, lists, cover pages, and other document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look.¶

You can easily change the formatting of selected text in the document text by choosing a look for the selected text from the Quick Styles gallery on the Home tab. You can also format text directly by using the other controls on the Home tab. Most

controls offer a choice of using the look from the current theme or using a format that you specify directly.¶

To change the overall look of your document, choose new Theme elements on the Page Layout tab. To change the looks available in the Quick Style gallery, use the Change Current Quick Style Set command. Both the Themes gallery and the Quick Styles gallery provide reset commands so that you can always restore the look of your document to the original contained in your current template.¶

Note This text includes a paragraph symbol (¶) that is displayed when sample text is inserted. You can control how many paragraphs and lines appear by adding numbers inside the parentheses of the **rand()** function. The **=rand()** function has the following syntax:
=rand(p,l)
Note In this function, p is the number of paragraphs, and l is the number of lines that you want to appear in each paragraph.
The following are some examples that show how the parameters work:

- **=rand(1)** inserts one paragraph with three lines of text in the paragraph.
- **=rand(10,10)** inserts 10 paragraphs with 10 lines of text in each paragraph.

The parameters are optional. If you omit the parameters, the default number of paragraphs is three, and the default number of lines per paragraph is also three.

Method 2: Use rand.old()
To insert localized sample text that is compatible with Microsoft Office Word 2003 and earlier versions, type =rand.old() in the document where you want the text to appear, and then press

ENTER. The sample text that is inserted in the English version of Word 2007 or Word 2010 appears resembles the following:

The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. ¶

The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. ¶

The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. ¶

You can control how many paragraphs and lines appear by adding numbers inside the parentheses of the **rand.old()** function. The =rand.old() function has the following syntax:

<div align="center">

=rand.old(p,l)

</div>

Note In this function, p is the number of paragraphs, and l is the number of lines that you want to appear in each paragraph. The parameters are optional. If you omit the parameters the default number of paragraphs is three, and the default number of lines per paragraph is also three.

Method 3: Use lorem()
To insert non-localized, pseudo-Latin sample text in Word 2007 or Word 2010, type **=lorem()** in the document where you want the text to appear, and then press ENTER. The sample text that is inserted resembles the following text:

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Maecenas porttitor congue massa. Fusce posuere, magna sed

pulvinar ultricies, purus lectus malesuada libero, sit amet commodo magna eros quis urna.¶

Nunc viverra imperdiet enim. Fusce est. Vivamus a tellus.¶

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Proin pharetra nonummy pede. Mauris et orci.¶

You can control how many paragraphs and lines appear by adding numbers inside the parentheses of the **lorem()** function. The **=lorem()** function has the following syntax: **lorem(p,l)**

Note In this function, p is the number of paragraphs, and l is the number of lines that you want to appear in each paragraph. The parameters are optional. If you omit the parameters the default number of paragraphs is three, and the default number of lines per paragraph is also three.

Practice 6
Working with Home Tab
The home tab are divided into 5 groups which are: clipboard, font, paragraph, styles and editing. We will work with the menus under each of the group accordingly.

   a) **Clipboard Group**: this group is made up of the following menus/commands; Paste, Cut, Copy and Format Painter.
If you would like to remove text from your document you can copy or cut the text from the document. Simply highlight the text and go to the **Home** tab in the **Clipboard** group and click **Cut** or **Copy**. You can also right click on your mouse and select **Cut** or **Copy**. If you Copy text, you typically need to Paste it somewhere. The Paste feature in 2010 is much more detailed than in previous versions of

Word. When you paste content, the Paste Options button provides different options, depending on the source of the content. To Paste, click on the area you want your information to be inserted and either go to the Home tab in the Clipboard group and click Paste or right click on your mouse and select Paste.

The Format Painter feature allows you to quickly copy a format that you have applied to text already in your document.

   i.   Select the text or graphic that has the formatting that you want to copy.
   ii. On the Home tab, in the Clipboard group, single click Format Painter. The pointer will change to a paintbrush icon.
   iii. Bring your cursor to the text or graphic that you want to format and click on the text.
   iv. To stop formatting, press ESC or click on the Format Painter command again.

Note: Double-Click The Format Painter Button If You Want To Change The Format Of Multiple Selections In your Document.
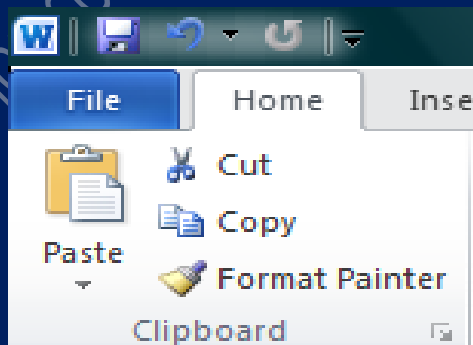
Figure 11h. Clipboard group

Let us practice by typing the following document in our working area of Microsoft word 2010;

YEKINI NURENI ASAFE IS ONE OF THE **Lecturers** OF YABA COLLEGE OF TECHNOLOGY, YABA LAGOS. HE CONTESTED FOR THE POST OF ASUP PRO OF YABATECH IN THE YEAR 2013. HE WON WITH 272 VOTES AGAINST HIS OPPONENT WHO HAD 108 VOTES. SINCE THEN HE HAS BEEN COMBINING ACADEMIC WORK WITH UNIONISM WITHOUT ANY HINDERANCES.

To Copy or Cut

i. Highlight the content/s to be copy or cut
ii. Click on cut or copy from the clipboard group

Note: when you cut the content cut will be permanently remove from it currently location and temporarily stored in the clipboard. When copy the content will be duplicated with original copy still remain in it is location and duplicate store temporarily in the clipboard.

Now do the followings

i- Cut YEKINI NURENI ASAFE from the sentence and paste it at the end of the document
ii- Use the format painter to format every word with at least 3 letters with format in the word **Lecturers**

b) **Font Group**: this group is made up of menus/commands to edit/format font in the words or sentences. The commands included are; bold command (Ctrl + B), Italic command (Ctrl + I), Underline command (Ctrl + U), strikethrough

command, Subscript command, superscript command, Grow font command (Ctrl + >), shrink font command (Ctrl + <), Change case command, Text effect menu, Text highlighting color, font color, font type (Ctrl + Shift + F), font size command (Ctrl + Shift + P) and clear formatting command. The dialog box for this group is as follow:
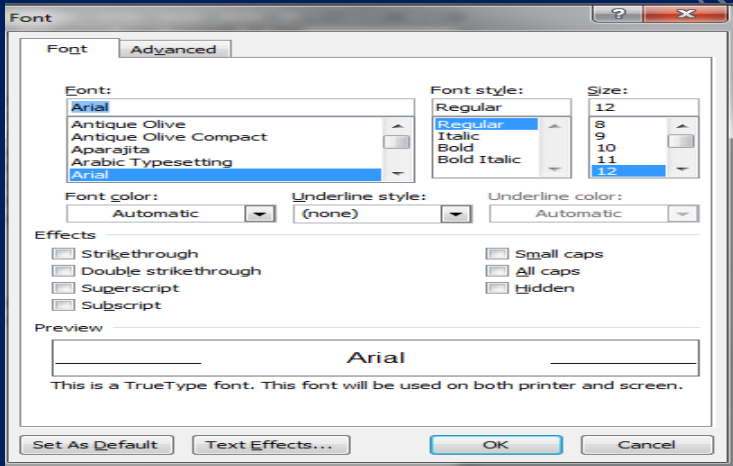
Figure 11h. Font group dialog box

Let us know ___ use of the commands/menus; refer to the previous used document in a). Highlight the word **OPPONENT** and perform the following activities:

i-   Change the font type to albertus extra bold
ii-   Font size 72
iii-   Font color yellow
iv-   Capitalize first letter of the word
v-   Underline the word
vi-   Invoke the font group dialog box

c) **Paragraph Group:** this group is made of the commands/menus to execute some tasks like; bullets, numbering list, align of texts, line and paragraph spacing, decrease and increase indent, shading, sort, etc. the dialog box for this group is as follows;
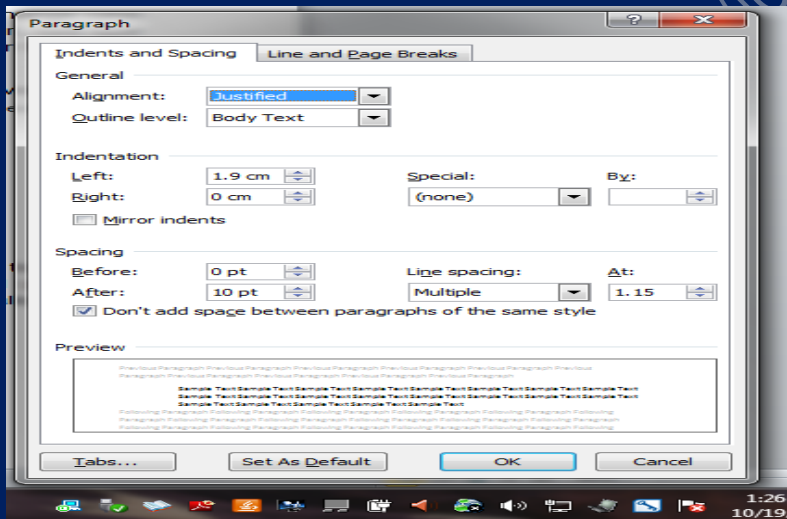
Figure11i. Font group dialog box

Let us try this simple exercise:

    i- Generate a sample text with 3 paragraphs and 3 sentences with MS word 2010

    ii- What is the default spacing between the lines and after each paragraph

    iii- Describe the procedure for adjusting line spacing in the generated sample text

Solution

i-	To generate the sample text type =ran() and press enter key

i-   To generate the sample text type =ran() and press enter key

ii-   The default spacing is 1.15 line spacing and 10 points after each paragraph. The default spacing in Office Word 2003 documents is 1.0 between lines and no blank line between paragraphs.

iii-   The easiest way to change the line spacing for an entire document is to highlight the paragraphs or entire document that you want to change the line spacing on.

   a) On the **Home** tab, in the **Paragraph** group, click **Line Spacing**.
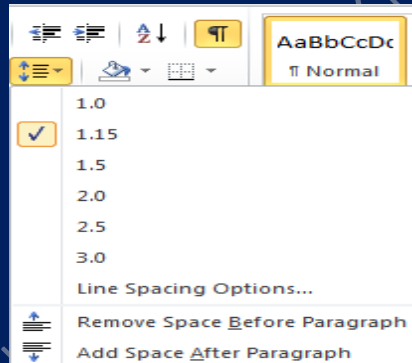
Figure11j. Line Spacing Dialog Box

   b) Do one of the following:
   Click the number of line spaces that you want. For example, click **1.0** to single-space with the spacing that is used in earlier versions of Word. Click **2.0** to double-space the selected paragraph. Click **1.15** to single-space with the spacing that is used in Word 2010.

c) Click **Remove Space Before Paragraph** to remove any additional lines added after each paragraph as a default

Note: If a line contains a large text character, graphic, or formula, Word increases the spacing for that line. To space all lines evenly within a paragraph, use exact spacing and specify an amount of space that is large enough to fit the largest character or graphic in the line. If items appear cut off, increase the amount of spacing.

Use of Sort, Bullets commands
Type the following lecturer names from department of computer technology on each line; use any bullet type from the bullet list and arrange the name in ascending and descending order

Yekini
Lawal
Ojo
Akinwole
Oladosu
Adigun
Alakiri
Ayannuga
Ikotun
Ogundele
Oladiboye
Oludipe
Oyeola

Procedures to Achieve the Set Objectives

i-   Highlight the names from Yekini to Oludipe on a vertical line
ii-   Click on bullet command to select bullet type you want
iii- Click on sort command in paragraph group: a dialog box appear
iv-   Click on sort type either ascending or descending order.
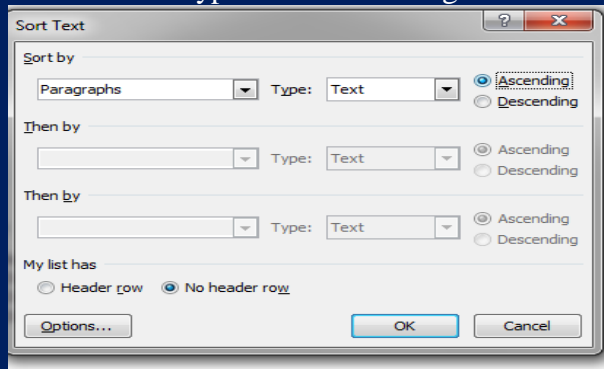
Figure11k. Sort Text Dialog Box

Here is the result after the
The names after inserting bullet

- ❖ Yekini
- ❖ Lawal
- ❖ Ojo
- ❖ Akinwole
- ❖ Oladosu
- ❖ Adigun
- ❖ Alakiri
- ❖ Ayannuga
- ❖ Ikotun
- ❖ Oyeola
- ❖ Ogundele
- ❖ Oladiboye
- ❖ Oludipe

Information Communication Technology (ICT)

The name after arrange in ascending
- ❖ Adigun
- ❖ Akinwole
- ❖ Alakiri
- ❖ Ayannuga
- ❖ Ikotun
- ❖ Lawal
- ❖ Ogundele
- ❖ Ojo
- ❖ Oladiboye
- ❖ Oladosu
- ❖ Oludipe
- ❖ Oyeola
- ❖ Yekini

The name after arrange in descending order
- ❖ Yekini
- ❖ Oyeola
- ❖ Oludipe
- ❖ Oladosu
- ❖ Oladiboye
- ❖ Ojo
- ❖ Ogundele
- ❖ Lawal
- ❖ Ikotun
- ❖ Ayannuga
- ❖ Alakiri
- ❖ Akinwole
- ❖ Adigun

d) **Styles group**: Using built-in heading styles is applicable to heading or subheading of our document. To use heading style

i.   Select the text that you want to appear in the heading.
ii.   On the Home tab, in the Styles group, click the style that you want.

e) Editing Group: this group contains the commands to find, replace and select information in the document.
To use the find and replace command a dialog box will be invoke as follow; to invoke the find and replace dialog box, double-click on find or replace icon in editing group or press F5 on the Keyboard.
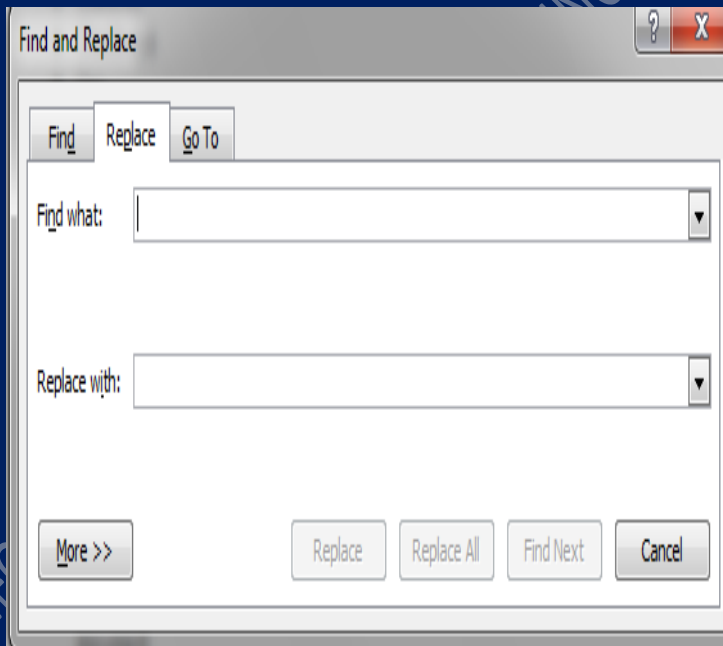
Figure 11j. Find and replace dialog box

Let us practice as follow;

i-   Generate three paragraph and five sentences sample text
ii-   Find the word gallery and replace it YEKINI
iii- How many replacements did you made?

Solution

i-   To generate sample text with three paragraph and five sentences, type =ran(3,5) at exact location where you want the sample text to appear. Then you have the following document.

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document. You can use these galleries to insert tables, headers, footers, lists, cover pages, and other document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look. You can easily change the formatting of selected text in the document text by choosing a look for the selected text from the Quick Styles yekini on the Home tab. You can also format text directly by using the other controls on the Home tab.

Most controls offer a choice of using the look from the current theme or using a format that you specify directly. To change the overall look of your document, choose new Theme elements on the Page Layout tab. To change the looks available in the Quick Style yekini, use the Change Current Quick Style Set command. Both the Themes yekini and the Quick Styles yekini provide reset commands so that you can always restore the look of your document to the original contained in your current template. On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document.

You can use these galleries to insert tables, headers, footers, lists, cover pages, and other document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look. You can easily change the formatting of selected text in the document text by choosing a look for the selected text from the Quick Styles yekini on the Home tab. You can also format text directly by using the other controls on the Home tab. Most controls offer a choice of using the look from the current theme or using a format that you specify directly.

ii-   To find the word gallery and replace it Yekini

    a) DoubleClick on replace or find command in editing group or press F5 on a keyboard. Find replace dialog box appear.

    b) In a find what textbox type gallery or copy gallery from the document and paste it inside the box

    c) In a replace with text box type Yekini

    d) Click on replace all

Note: At the end 5 replacement will be made an you have the following dialog box.
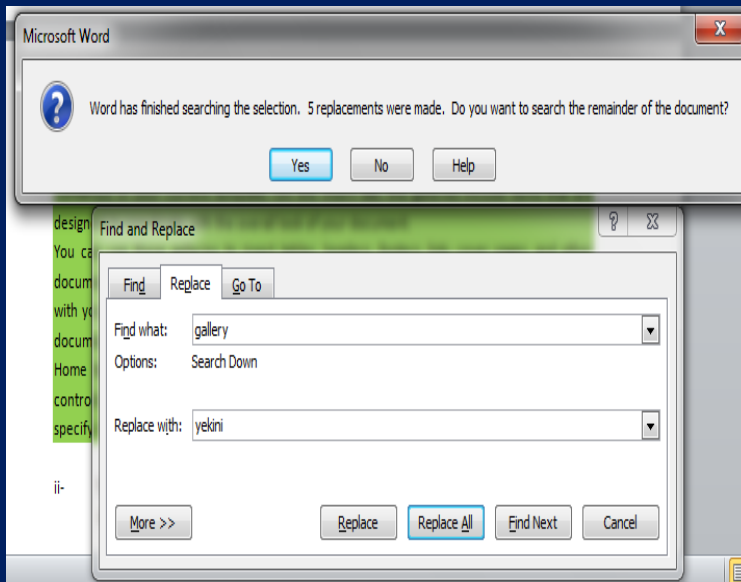
Figure 11k. Find and replace dialog box

Practice 7
Working with Insert Tab
Insert tab is divided into 7 main groups which are; pages, tables, illustrations, links, header and footers, text and symbol.

a) Page group is made up of cover page, plank page and page break commands, a cover page will enable us to generate front cover for our document.

To Insert/Remove Cover Page
- i-   Open the document to insert cover page
- ii-   DoubleClick on cover page icon in page group and select the cover page from options available.
- iii-   To remove the cover page click remove current cover page
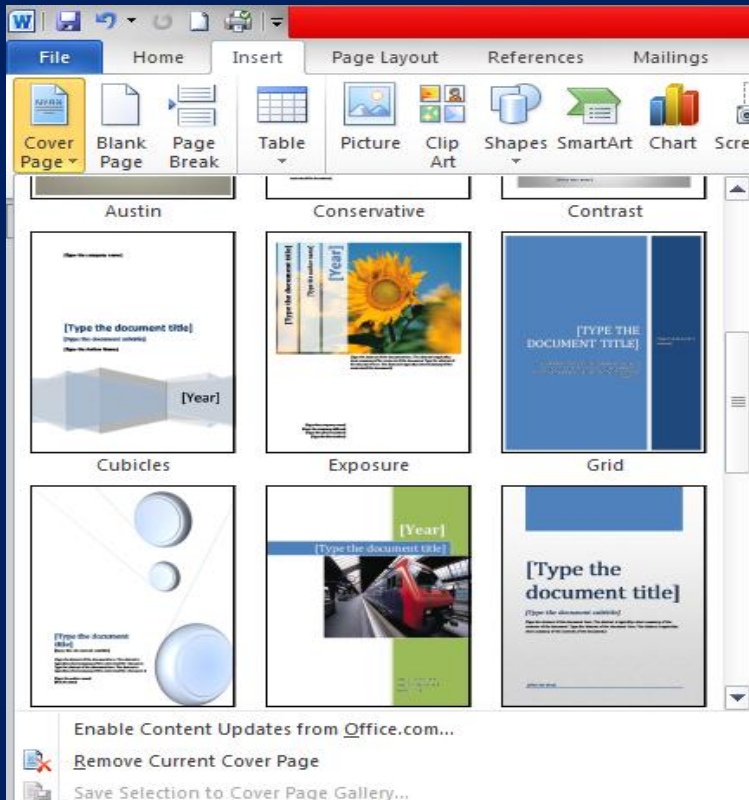
Figure 11l. Insert cover dialog box

To Insert Blank Page

MS Word automatically jumped to another page when the cursor reaches the bottom margin of the current page. A case may warranty generation of new page without exhausting the current page. To insert blank page we follow the procedure below

<ol type="i">
Click on insert tab of the ribbon
On page group click on Bank page; the new page is generated below the current page

Insert Page Break

Word automatically inserts a page break when you reach the end of a page. If you want the page to break in a different place, you can insert a manual page break. Or you can set up rules for Word to follow so that the automatic page breaks are placed where you want them. This is especially helpful if you are working in a long document.

<ol type="i">
Click where you want to start a new page.
On the Insert tab, in in the Pages group, click Page Break.

<ol type="b" start="2">
Tables: In Microsoft Word, you can insert a table in three ways: choosing from a selection of preformatted tables — complete with sample data — or by selecting the number of rows and columns that you want. You can insert a table into a document, or you can insert one table into another table to create a more complex table.
<ol type="i">
Choose from a gallery of preformatted table templates.
Use the Table menu to specify the number of rows and columns that you want.
Use the Insert Table dialog box.

Procedure to Insert Table

<ol type="i">
Click where you want to insert a table.
On the Insert tab, in the Tables group
Click Table a dialog box appear
Key in the number of rows and column
Click ok

Note you can also use other options like, draw table, excel spreadsheet table, convert text to table and quick table option.
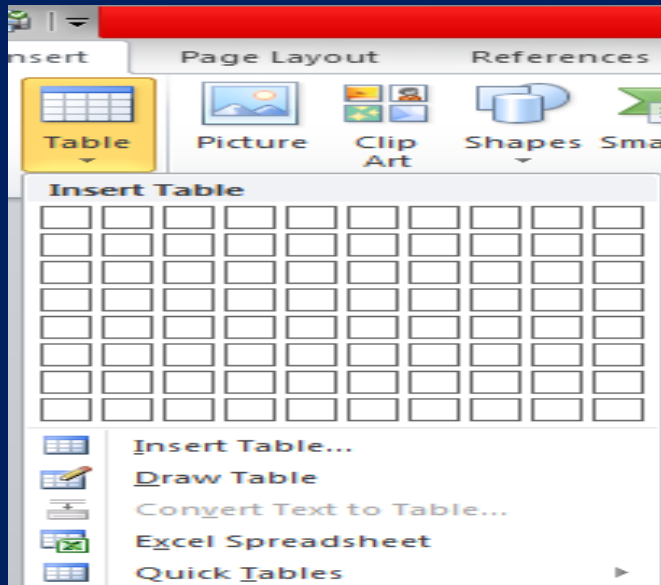
Figure11m. Insert table dialog box

c) Header and Footers

If you want to add a graphic or text at the top or the bottom of your document, you need to add a header or footer. You can quickly add a header or footer from the galleries or you can add a custom header or footer. You can use these same steps to add a header or footer without page numbers.

Add a Header or Footer from The Gallery

      i.   On the Insert tab, in the Header & Footer group, click Header or Footer.

ii.   Click the header or footer that you want to add to your document.

iii.   To return to the body of your document, click Close Header and Footer on the Design tab (under Header & Footer Tools)

Add a Custom Header Or Footer

i.   Double-click in the header area or the footer area (near the top of the page or near the bottom of the page). This opens the Design tab under Header & Footer Tools.

ii.   To place information in the center or on the right side of the page, do any of the following:

- To place information in the center, click Insert Alignment Tab in the Position group of the Design tab, click Center, and then click OK.

- To place information on the right side of the page, click Insert Alignment Tab in the Position group of the Design tab, click Right, and then click OK.

iii.   Do one of the following:

- Type the information that you want in your header.

- Add a field code by clicking the Insert tab, clicking Quick Parts, clicking Field, and then clicking the field you want in the Field names list.

Examples of information that you can add by using fields include Page (for page number), NumPages (for the total number of pages in your document), and FileName (you can include the file path).

iv.   If you add a Page field, you can change the numbering format by clicking Page Number in the

Header & Footer group, and then clicking Format Page Numbers.

v.   To return to the body of your document, click Close Header and Footer on the Design tab (under Header & Footer Tools).

Add A Page Number Without Any Other Information

If you want a page number on each page, and you don't want to include any other information, such as the document title or the location of the file, you can quickly add a page number from the gallery, or you can create a custom page number or a custom page number that includes the total number of pages (page X of Y pages).

i.   On the Insert tab, in the Header & Footer group, click Page Number.

ii.   Click the page number location that you want.

iii.   In the gallery, scroll through the options, and then click the page number format that you want.

iv.   To return to the body of your document, click Close Header and Footer on the Design tab (under Header & Footer Tools).

Add a Custom Page Number

i.   Double-click in the header area or the footer area (near the top of the page or near the bottom of the page). This opens the Design tab under Header & Footer Tools.

ii.   To place your page number in the center or on the right side of the page, do the following:

-    To place your page number in the center, click Insert Alignment Tab in the Position group of the Design tab, click Center, and then click OK.
-    To place your page number on the right side of the page, click Insert Alignment Tab in the Position group of the Design tab, click Right, and then click OK.

iii.   On the Insert tab, in the Text group, click Quick Parts, and then click Field.
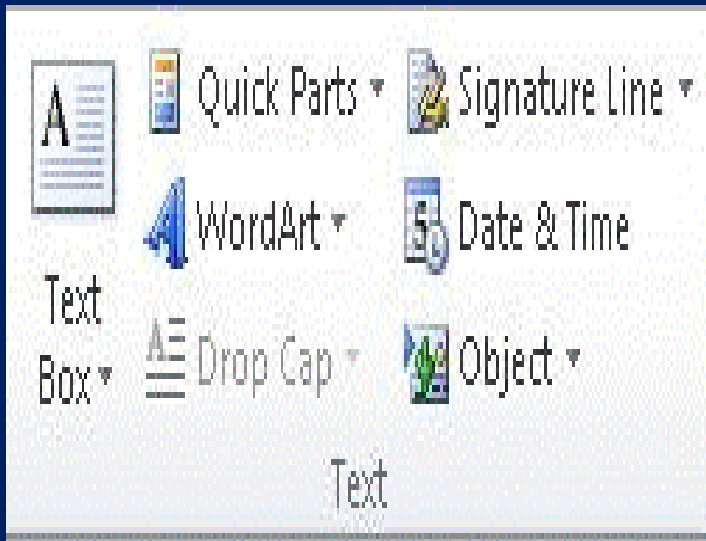
iv. In the Field names list, click Page, and then click OK.
v. To change the numbering format, click Page Number in the Header & Footer group, and then click Format Page Numbers.
vi. To return to the body of your document, click Close Header and Footer on the Design tab (under Header & Footer Tools).

d) Text Group: the commands in this group include text box, quick parts, Wordart, drop cap etc.

To Use Wordart

You can use WordArt to add special text effects to your document. For example, you can stretch a title, skew text, make text fit a preset shape, or apply a gradient fill. This WordArt becomes an object that you can move or position in your document to add decoration or

emphasis. You can modify or add to the text in an existing WordArt object whenever you want.

Adding Wordart
i. On the Insert tab, in the Text group, click WordArt, and then click the WordArt style that you want.
ii. Enter your text.

Convert Existing Text To Wordart In Powerpoint
i. Select the text that you want to convert to WordArt.
ii. On the Insert tab, in the Text group, click WordArt, and then click the WordArt that you want.

Inserting Text Boxes
A text box is an object that lets you put and type text anywhere in your file.
i. On the Insert tab, in the Text group, click Text Box and a drop down menu will appear.
ii. Click on a text box template or click Draw Text Box at the bottom of the drop down menu to draw your own text box.
iii. If you elect to draw your own text box you need to click in the document, and then drag to draw the text box the size that you want.
iv. To add text to a text box, click inside the text box, and then type or paste text. To format text in the text box, select the text, and then use the formatting options in the Font group on the Home tab. To position the text box, click it, and then when the pointer becomes a , drag the text box to a new location.

Note: If you have problems printing text boxes, make sure that the Print drawing created in Word check box is selected. To do this, click the File tab, click Options, click Display, and then

under Printing Options, select the Print drawings created in Word check box.

Deleting Text Boxes
To remove a text box just click the border of the text box that you want to delete, and then press DELETE. Make sure that the pointer is not inside the text box, but rather on the border of the text box. If the pointer is not on the border, pressing DELETE will delete the text inside the text box and not the text box.

Insert Wordart
WordArt can be used to add special text effects to your document. For example, you can stretch a title, skew text, make text fit a preset shape, or apply a gradient fill. This WordArt becomes an object that you can move or position in your document to add decoration or emphasis. You can modify or add to the text in an existing WordArt object whenever you want. To add WordArt to text in your document, complete the following steps:

  i.   On the Insert tab, in the Text group, click WordArt,
  ii. A Drop down menu will appear, click the WordArt style that you want.
  iii. A Text Box will appear with the words" Enter your text here", Enter your text.

Insert Picture/Clip Art
Pictures and clip art can be inserted or copied into a document from many different sources, including downloaded from a clip art Web site provider, copied from a Web page, or inserted from a folder where you save pictures.

Insert Clip Art
  i.   On the Insert tab, in the Illustrations group, click Clip Art.

ii. A Clip Art task pane will appear on the right of your screen, in the Search for box, type a word or phrase that describes the clip art that you want.
iii. Click Go.
iv. In the list of results, double click on the clip art to insert it into your document.

Insert Picture from Web
i. Open the document.
ii. From the Web page, drag the picture that you want into the Word document.

Insert Picture from File
To insert a picture saved in your computer, insert it by following these steps.
i. Click where you want to insert the picture in your document.
ii. On the Insert tab, in the Illustrations group, click Picture.
iii. Locate the picture that you want to insert. For example, you might have a picture file located in My Documents.
iv. Double-click the picture that you want to insert and it will appear in your document. NOTE: To resize a picture, select the picture you've inserted in the document. To increase or decrease the size in one or more directions, drag a sizing handle away from or toward the center, while you do one of the following:

Cropping a Picture
Cropping reduces the size of a picture by removing vertical or horizontal edges. Cropping is often used to hide or trim a part of a picture, either for emphasis or to remove unwanted portions.
i. Click on the picture that you want to crop.
ii. Go to Picture Tools, on the Format tab, in the Size group, click Crop.

iii. Black dotted lines will appear around your picture. Then drag the center cropping handle on that side inward.
iv. As you drag the cropping handle you will notice the area of your graphic you want removed will become gray.
v. Once you have cropped out everything you want, click outside of the graphic for the gray area you want removed to disappear.

Practice 8
Working With Page Layout Tab
The page layout tab is made up of the following groups; theme, page setup, page background, paragraph, arrange. We shall discuss page setup and page background group. The page setup group is made up of the following commands/menus; margin, orientation, size, line numbers etc. to execute some of the commands in page setup; it is advisable to invoke page setup dialog box.

To Invoke Page Setup Dialog box
i. Click on page layout
ii. Click on the arrow by the bottom right hand side of the page setup
iii. You can now execute any of the commands
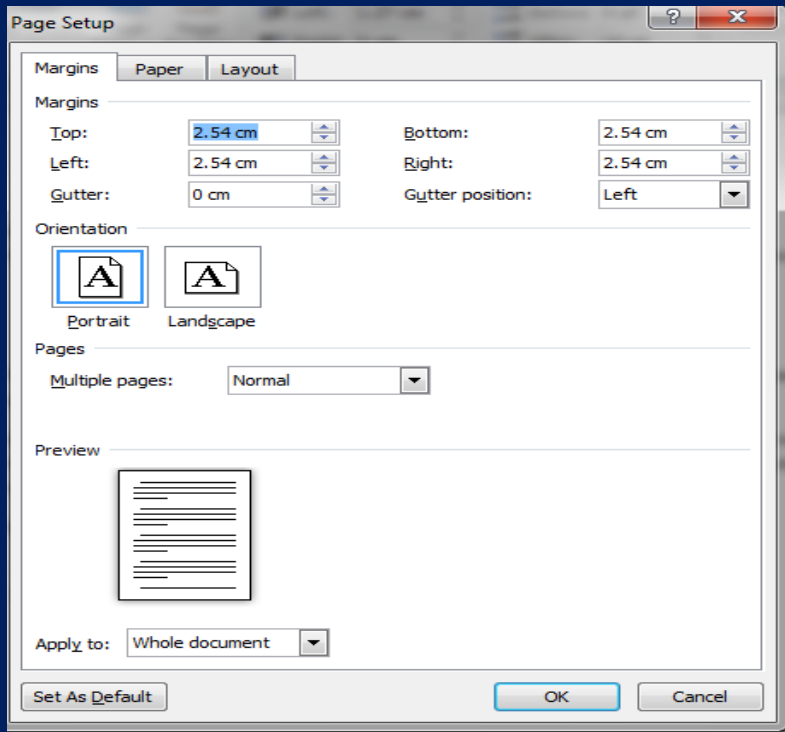
Figure 11n. Page setup dialog box

Page Background
The page background is made up of 3 commands which are; watermark, page color, and page border.

To Insert Watermark
i.   Activate page layout by click page layout tab
ii.   Click on watermark in page background group
iii. Click on the watermark type you want
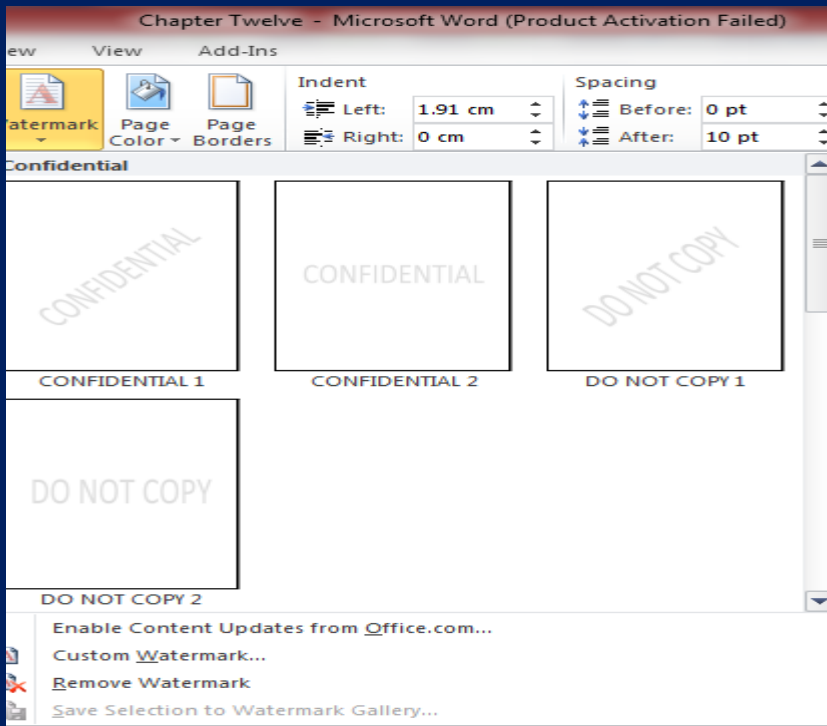
Figure11o. Watermark dialog box

iv.   Click on customize watermark to design your own
        watermark
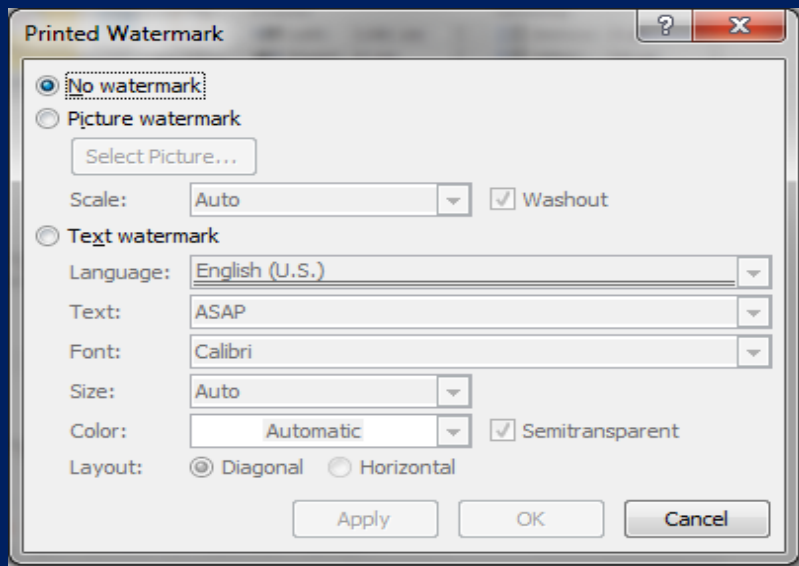
Figure 11p. Customize watermark dialog box

Note: to remove the water mark, repeat step I – ii, and click on remove water mark from the dialog box.

To insert page color
- i. Activate page layout by click page layout tab
- ii. Click on page color in page background group
- iii. Click on the color you want
- iv. You can also use fill effects by clicking field effect command in page color dialog box

To Insert Page Border
- i. Activate page layout by click page layout tab
- ii. Click on page border command in page background group

    The page border dialog box appears as follows;
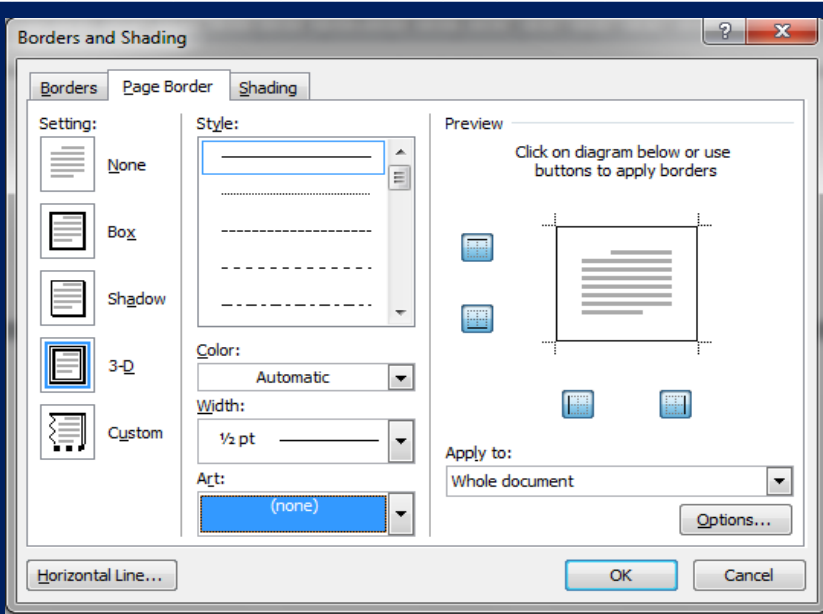
Figure 11q. Border and shading dialog box

    iii.   Select the page border type from setting or art gallery

    iv.   Click ok.

Create Columns

Columns can be used in documents such as brochures, newsletters or to save space when creating lists.

Add columns before entering text:

    i.   Go to the Page Layout tab, in the Page Setup group, click Columns.

    ii.   Click the layout that you want. Your document will be formatted in columns.

Note: To add a vertical line between the columns, click Columns again, click More Columns, and then select the Line between check box. You can also adjust the column width and spacing.

Add Columns to Part of a Document
To do that highlight the texts you want formatted in columns, or place your cursor where you want columns to begin.

i. On the Page Layout tab, in the Page Setup group, click Columns.
ii. Click More Columns.
iii. Click the number of columns that you want.
iv. In the Apply to list, click selected text or this point forward.

Note: To change the layout again further on in your document, select text or click where you want to change the layout, and then follow the same steps. For example, you can change from one column to a two-column layout, and then you can change back to the single-column layout on a later page.

Practice 9
Working with Reference Tab
Reference tab is made up of the following groups; table of contents, footnotes, citation and bibliography, captions, index, and table of authority.

Table of Contents
We create a table of contents by applying heading styles for example, Heading 1, Heading 2, and Heading 3 to the text that we want to include in the table of contents. Microsoft Office Word searches for those headings and then inserts the table of contents into your document. When you create a table of contents this way, you can automatically update it if you make changes in your document. Microsoft Office Word 2010 provides a gallery of automatic table of contents styles. Mark the table of contents entries, and then click the table of contents style that you want from the gallery of options. You can also create a custom table of contents

with the options you choose and any custom styles that you've applied by using the Table of Contents dialog box.

Mark Entries for A Table Of Contents
The easiest way to create a table of contents is to use the built-in heading styles (heading style: Formatting applied to a heading. Microsoft Word has nine different built-in styles: Heading 1 through Heading 9.). You can also create a table of contents that is based on the custom styles that you have applied. Or you can assign the table of contents levels to individual text entries.

Mark entries by using built-in heading styles
  i.   Select the text that you want to appear in the table of contents.
  ii.   On the Home tab, in the Styles group, click the style that you want.
For example, if you selected text that you want to style as a main heading, click the style called Heading 1 in the Quick Style gallery.
Notes
If you don't see the style that you want, click the arrow to expand the Quick Style gallery.
If the style that you want does not appear in the Quick Style gallery, press CTRL+SHIFT+S to open the Apply Styles task pane. Under Style Name, click the style that you want.

Create a Table Of Contents From The Gallery

After you mark the entries for your table of contents, you are ready to build it.

i.   Click where you want to insert the table of contents, usually at the beginning of a document.

ii.   On the References tab, in the Table of Contents group, click Table of Contents, and then click the table of contents style that you want.
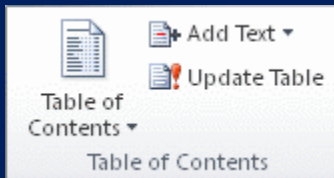
Note   If you want to specify more options — for example, how many heading levels to show — click Insert Table of Contents to open the Table of Contents dialog box. To find out more about the different options.

Create a Custom Table of Contents

i.   On the References tab, in the Table of Contents group, click Table of Contents, and then click Insert Table of Contents.
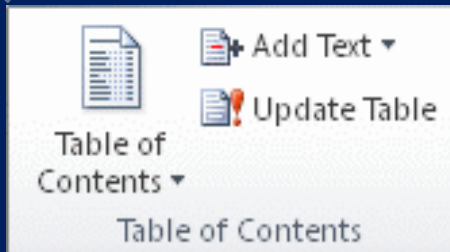
ii.   In the Table of Contents dialog box, do any of the following:

- To change how many heading levels are displayed in the table of contents, enter the number that you want in the box next to Show levels, under General.
- To change the overall look of your table of contents, click a different format in the Formats list. You can see what your choice looks like in the Print Preview and Web Preview areas.
- To change the type of line that appears between the entry text and the page number, click an option in the Tab leader list.
- To change the way heading levels are displayed in the table of contents, click Modify. In the Style dialog box, click the level that you want to change, and then click Modify. In the Modify Style dialog box, you can change the font, the size, and the amount of indentation.

iii.   To use custom styles in the table of contents, click Options, and then do the following:
- Under Available styles, find the style that you applied to the headings in your document.
- Under TOC level, next to the style name, type a number from 1 to 9 to indicate the level that you want the heading style to represent.

    Note   If you want to use only custom styles, delete the TOC level numbers for the built-in styles, such as Heading 1.

- Repeat step 1 and step 2 for each heading style that you want to include in the table of contents.
- Click OK.

iv.   Choose a table of contents to fit the document type:
- Printed document If you are creating a document that readers will read on a printed page, create a table of contents in which each entry lists both the heading

and the page number where the heading appears. Readers can turn to the page that they want.
- ▪ Online document For a document that readers will read online in Word, you can format the entries in the table of contents as hyperlinks, so that readers can go to a heading by clicking its entry in the table of contents.

Update the Table Of Contents
If you added or removed headings or other table of contents entries in your document, you can quickly update the table of contents.

    i.   On the References tab, in the Table of Contents group, click Update Table.

    ii.   Click Update page numbers only or Update entire table.

Delete a Table of Contents

    i.   On the References tab, in the Table of Contents group, click Table of Contents.

    ii.   Click Remove Table of Contents.

Practice 10
Working With Mailings Tab
We use mail merge when you want to create a set of documents, such as a form letter that is sent to many customers. Each document has the same kind of information, yet some of the content is unique. For example, in letters to your customers, you can personalize each letter to address each customer by name. The unique information in each letter comes from entries in a data source. We use commands on the Mailings tab to perform a mail merge.
The mail merge process entails the following overall steps:

i. Set up the main document. The main document contains the text and graphics that are the same for each version of the merged document — for example, the return address in a form letter.

ii. Connect the document to a data source. A data source is a file that contains the information to be merged into a document. For example, the names and addresses of the recipients of a letter.

iii. Refine the list of recipients or items. Microsoft Word generates a copy of the main document for each recipient or item in your data file. If you want to generate copies for only certain items in your data file, you can choose which items (or records) to include.

iv. Add placeholders, called mail merge fields, to the document. When you perform the mail merge, the mail merge fields are filled with information from your data file.

v. Preview and complete the merge. You can preview each copy of the document before you print the whole set.

Procedure for Mail Merge in MS Word 2010

On the Mailings tab, click Start Mail Merge, and then click Step by Step Mail Merge Wizard.

The Mail Merge task pane appears.

Step 1 of 6: Select document type

Under Select Document Type, click E-mail Messages.

Click Next: Starting Document.

Step 2 of 6: Select starting document

Under Select starting document are three choices: Use the current document, Start from a template, and Start from existing document. When you click each option, additional information about the option appears in the task pane.

Click Next: Select Recipients to continue.

Step 3 of 6: Select recipients

If you select Use an existing list, click Browse to locate and choose your file. Click Edit recipient list to modify the address list after it is created.

If you select Select from Outlook contacts, click Choose Contacts Folder. If Outlook is not open, you will be prompted for your Outlook profile.

If you select Type a new list, you can create a new address list.

Click Next: Write your e-mail message to continue.

Step 4 of 6: Write your e-mail message

At this point, you insert your merge fields. You can use a combination of items:

Address Block: Use this item to insert fields that will insert a block of text, such as the name and address.

Greeting Line: Use this item to choose the format that you want on your greeting line.

Electronic Postage: Use this item if you have electronic postage software on your computer that is compatible with Word.

More Items: Use this item to enter any other fields that are in your recipient list.

Click Next: Preview your e-mail messages to continue.

Step 5 of 6: Preview your e-mail message

You can preview just one message of your mail merge, or you can preview all of them. You also can click Edit recipient list to remove names or add to your recipient list.

After you preview your message, click Next: Complete the merge to continue.

Step 6 of 6: Complete the merge

Click Electronic Mail.

When the Merge to E-mail dialog box appears, select the field that you want to use for the to line, type the subject in the Subject line, and then select the mail format that you want to use.

Click OK to send your messages.

Practice 10
Working With Review Tab
The Review tab is divided into the following groups; proofing, language, comments, tracking, changes, compare, and protect.

To Use Spelling and Grammar Command
Spelling and grammar command is the fastest way to fix spelling errors in a document

  i.   Put your cursor over the misspelled word and right click.
  ii. A drop down box will appear with correct spellings of the word.
  iii. Highlight and left click the word you want to replace the incorrect word with. To complete a more comprehensive Spelling and Grammar check, you can use the Spelling and Grammar feature.
      ▪ Click on the Review tab
      ▪ Click on the Spelling & Grammar command (a blue check mark with ABC above it).
  iv. A Spelling and Grammar box will appear.
  v.   You can correct any Spelling or Grammar issue within the box.
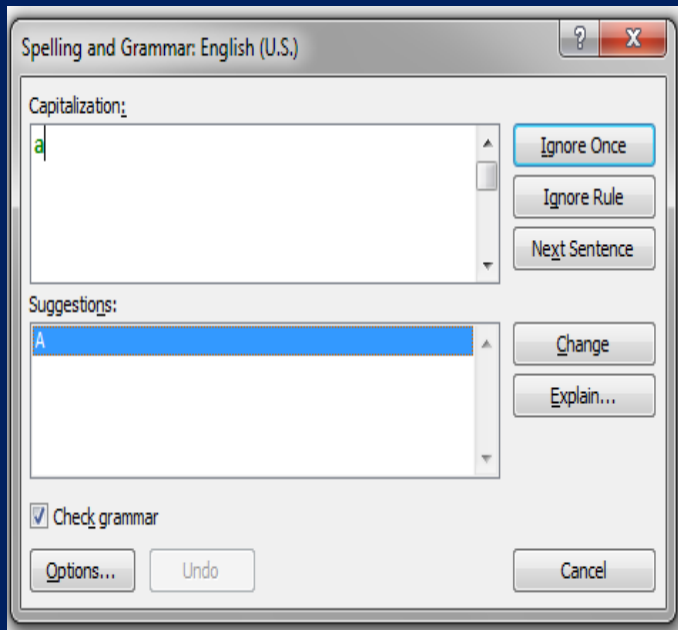
Figure 11r. Spelling and grammar dialog box

To Use Word count
i.   Activate review tab
ii.   Click on word count, then you have this result that gives
        the statistics of your document
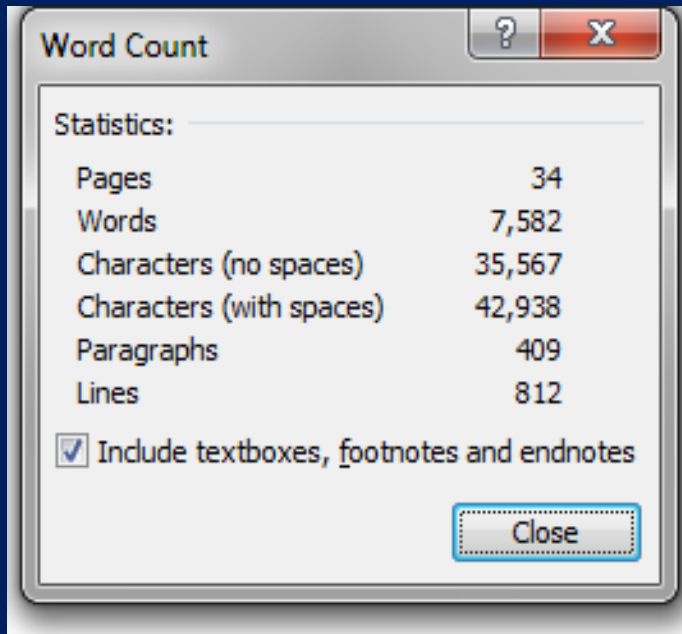
Figure 11s. Word count result board

Insert a Comment

You can insert a comment inside balloons that appear in the document margins. You can also hide comments from view. If you don't want comments to appear in your document during a review, you must clear your document of comments by deleting them. To find out whether comments remain in your document, click Show Markup on the Review tab in the Tracking group.

i.   Select the text or item that you want to comment on, or click at the end of the text.
ii.   On the **Review** tab, in the **Comments** group, click **New Comment**.
iii.   Type the comment text in the comment balloon or in the **Reviewing Pane**.

Delete a Comment

i. To quickly delete a single comment, right-click the comment, and then click Delete Comment.
ii. To quickly delete all comments in a document, click a comment in the document. On the Review tab, in the Comments group, click the arrow below Delete, and then click Delete All Comments in Document.

Delete Comments from a Specific Reviewer

i. On the Review tab, in the Tracking group, click the arrow next to Show Markup.
ii. To clear the check boxes for all reviewers, point to Reviewers, and then click All Reviewers.
iii. Click the arrow next to Show Markup again, point to Reviewers, and then click the name of the reviewer whose comments you want to delete.
iv. In the Comments group, click the arrow below Delete Button image, and then click Delete All Comments Shown.

Change a Comment

If comments aren't visible on the screen, click Show Markup in the Tracking group on the Review tab.

i. Click inside the balloon for the comment that you want to edit.
ii. Make the changes that you want.

Add or Change the Name Used in Comments

i. On the Review tab, in the Tracking group, click the arrow next to Track Changes, and then click Change User Name.
ii. Under Personalize your copy of Microsoft Office, change the name or initials that you want to use in your own comments.

Practice 11
Print Preview
Print Preview automatically displays when you click on the Print tab. whenever you make a change to a print-related setting, the preview is automatically updated.

   i.   Click the File tab, and then click Print. To go back to your document, click the File tab.
  ii.   A preview of your document automatically appears. To view each page, click the arrows below the preview.

Print
The Print tab is the place to go to make sure you are printing what you want.

1. Click the File tab.
2. Click the Print command to print a document.
3. Click the Print button to print your document.
4. This dropdown shows the currently selected printer. Clicking the dropdown will display other available printers.
5. These dropdown menus show currently selected Settings. Rather than just showing you the name of a feature, these dropdown menus show you what the status of a feature is and describes it. This can help you figure out if you want to change the setting from what you have.
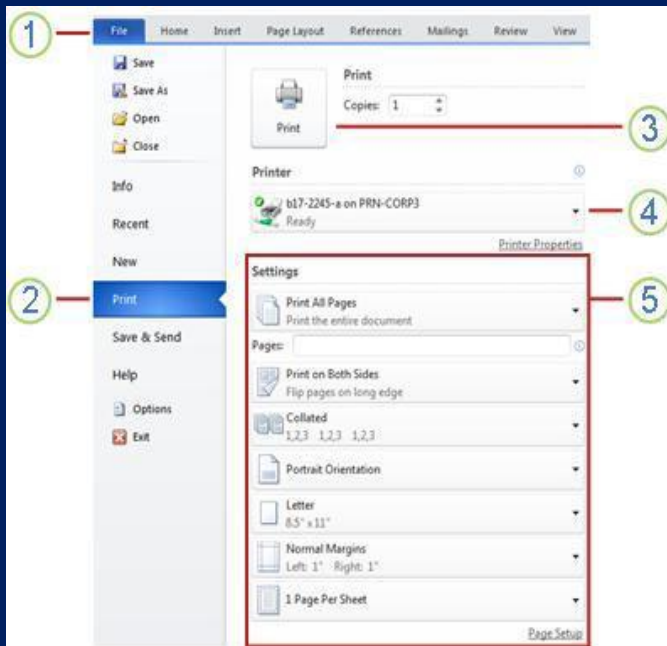
Figure 11t. Printing dialog box

Practice 12
Save a Document
To save a document in the format used by Word 2010 and Word 2007, do the following:
    i.   Click the File tab.
    ii.   Click Save As.
    iii.   In the File name box, enter a name for your document.
    iv.   Click Save.

To save a document so that it is compatible with Word 2003 or earlier, do the following:
    i.   Click the File tab.
    ii.   Click Save As.

iii.   In the Save as type list, click Word 97-2003 Document. This changes the file format to .doc.
iv.   In the File name box, type a name for the document.
v.   Click Save.

11.4   Review Questions

1. Describe word processing packages, and give any 5 example of word processing package you know.
2. Describe 5 basic and 5 standard features of word processor packages
3. Discuss area of application of word processor in business organization
4. Describe the component of MS word 2010 ribbon
5. Why quick access toolbar
6. Describe 3 major commands to generate sample text in MS word 2010
7. Identify the 6 major procedures to mail merge in MS word 2010
8. Define ribbon and give function of components of ribbon in ms-word 2010
9. Highlights procedure to find and apply a template in word 2010
10. Paste options in ms-2010 provides different option, describe any 5 of the options
11. Explain briefly the term format painter
12. Describe smart graphic and highlights the procedure to create smart graphic
13. Describe a procedure to save a document so that it is compatible with Word 2003 or earlier.
14. Describe the function of this command =rand(9,10) in MS-word

1. All of the following are examples of real security and privacy risks EXCEPT:

A. hackers.   B. spam.

C. viruses.   D. identity theft.

2. A process known as _____ is used by large retailers to study trends.

A. data mining   B. data selection

C. POS   D. data conversion

3. _____terminals (formerly known as cash registers) are often connected to complex inventory and sales computer systems.

A. Data   B. Point-of-sale (POS)

C. Sales   D. Query

4. A(n) _____ system is a small, wireless handheld computer that scans an items tag and pulls up the current price (and any special offers) as you shop.

A. PSS   B. POS

C. inventory   D. data mining

5. The ability to recover and read deleted or damaged files from a criminal's computer is an example of a law enforcement specialty called:

A. robotics.   B. simulation.

C. computer forensics.   D. animation.

6. Which of the following is NOT one of the four major data processing functions of a computer?

A. gathering data   B. processing data into information

C. analyzing the data or information   D. storing the data or information

7. _____ tags, when placed on an animal, can be used to record and track in a database all of the animals movements.

A. POS   B. RFID

C. PPS   D. GPS

8. Surgeons can perform delicate operations by manipulating devices through computers instead of manually. This technology is known as:

A. robotics.   B. computer forensics.

C. simulation.   D. forecasting.

9. Technology no longer protected by copyright, available to everyone, is considered to be:

A. proprietary.   B. open.

C. experimental.   D. in the public domain.

10. _____ is the study of molecules and structures whose size ranges from 1 to 100 nanometers.

A. Nanoscience   B. Microelectrodes

C. Computer forensics   D. Artificial intelligence

11. _____ is the science that attempts to produce machines that display the same type of intelligence that humans do.

A. Nanoscience   B. Nanotechnology

C. Simulation   D. Artificial intelligence (AI)

12. _____ is data that has been organized or presented in a meaningful fashion.

A. A process   B. Software

C. Storage   D. Information

13. The name for the way that computers manipulate data into information is called:

A. programming.   B. processing.

C. storing.   D. organizing.

14. Computers gather data, which means that they allow users to _____ data.

A. present   B. input

C. output   D. store

Answer: B

15. After a picture has been taken with a digital camera and processed appropriately, the actual print of the picture is considered:

A. data.   B. output.
C. input.   D. the process.
16. Computers use the _____ language to process data.
A. processing   B. kilobyte
C. binary   D. representational
17. Computers process data into information by working exclusively with:
A. multimedia.   B. words.
C. characters.   D. numbers.
18. In the binary language each letter of the alphabet, each number and each special character is made up of a unique combination of:
A. eight bytes.   B. eight kilobytes.
C. eight characters.   D. eight bits.
19. The term bit is short for:
A. megabyte.   B. binary language.
C. binary digit.   D. binary number.
20. A string of eight 0s and 1s is called a:
A. megabyte.   B. byte.
C. kilobyte.   D. gigabyte.
21. A _____ is approximately one billion bytes.
A. kilobyte   B. bit
C. gigabyte   D. megabyte
22. A _____ is approximately a million bytes.
A. gigabyte   B. kilobyte
C. megabyte   D. terabyte
23. _____ is any part of the computer that you can physically touch.
A. Hardware   B. A device
C. A peripheral   D. An application
24. The components that process data are located in the:
A. input devices.   B. output devices.
C. system unit.   D. storage component.
25. All of the following are examples of input devices EXCEPT a:

A. scanner.   B. mouse.
C. keyboard.   D. printer.
26. Which of the following is an example of an input device?
A. scanner   B. speaker
C. CD   D. printer
27. All of the following are examples of storage devices EXCEPT:
A. hard disk drives.   B. printers.
C. floppy disk drives.   D. CD drives.
28. The _____, also called the brains of the computer, is responsible for processing data.
A. motherboard   B. memory
C. RAM   D. central processing unit (CPU)
29. The CPU and memory are located on the:
A. expansion board.   B. motherboard.
C. storage device.   D. output device.
30. Word processing, spreadsheet, and photo-editing are examples of:
A. application software.   B. system software.
C. operating system software.   D. platform software.
31. _____ is a set of computer programs used on a computer to help perform tasks.
A. An instruction   B. Software
C. Memory   D. A processor
32. System software is the set of programs that enables your computer's hardware devices and _____ software to work together.
A. management   B. processing
C. utility   D. application
33. The PC (personal computer) and the Apple Macintosh are examples of two different:
A. platforms.   B. applications.
C. programs.   D. storage devices.

34. Apple Macintoshes (Macs) and PCs use different _____ to process data and different operating systems.
A. languages   B. methods
C. CPUs   D. storage devices

35. Servers are computers that provide resources to other computers connected to a:
A. network.   B. mainframe.
C. supercomputer.   D. client.

36. Smaller and less expensive PC-based servers are replacing _____ in many businesses.
A. supercomputers   B. clients
C. laptops   D. mainframes

37. _____ are specially designed computers that perform complex calculations extremely rapidly.
A. Servers   B. Supercomputers
C. Laptops   D. Mainframes

38. DSL is an example of a(n) _____ connection.
A. network   B. wireless
C. slow   D. broadband

39. The difference between people with access to computers and the Internet and those without this access is known as the:
A. digital divide.   B. Internet divide.
C. Web divide.   D. broadband divide.

40. _____ is the science revolving around the use of nanostructures to build devices on an extremely small scale.
A. Nanotechnology   B. Micro-technology
C. Computer forensics   D. Artificial intelligence

41. Which of the following is the correct order of the four major functions of a computer?
A.   Process--Output--Input-- Storage
B.   Input--Output--Process-- Storage
C.   Process--Storage--Input-- Output
D.   Input--Process--Output-- Storage

Answer: D

42. _____ bits equal one byte.
A. Eight   B. Two
C. One thousand   D. One million

43. The binary language consists of _____ digit(s).
A. 8   B. 2
C. 1,000   D. 1

44. A byte can hold one _____ of data.
A. bit   B. binary digit
C. character   D. kilobyte

45. _____ controls the way in which the computer system functions and provides a means by which users can interact with the computer.
A. The platform   B. The operating system
C. Application software   D. The motherboard

46. The operating system is the most common type of _____ software.
A. communication   B. application
C. system   D. word-processing software

47. _____ is specially designed computer chips that reside inside other devices, such as your car or your electronic thermostat.
A. Servers   B. Embedded computers
C. Robotic computers   D. Mainframes

48. The steps and tasks needed to process data, such as responses to questions or clicking an icon are called:
A. instructions.   B. the operating system.
C. application software.   D. the system unit.

49. The two broad categories of software are:
A. word processing and spreadsheet.   B. transaction and application.
C. Windows and Mac OS.   D. system and application.

50. The metal or plastic case that holds all the physical parts of the computer is the:
A. system unit.   B. CPU.
C. mainframe.   D. platform.

Fill in the Blank:
51. Between PCs and Macs, the _____ is the platform of choice for graphic design and animation.
52. The _____ is the program that manages the hardware of the computer system, including the CPU, memory, storage devices, and input/output devices.
53. The type of operating system software you use depends on your computer_____.
54. _____software helps you carry out tasks, such as typing a document or creating a spreadsheet.
55. _____are the fastest and most expensive computers.
56. A _____ is approximately 1,000 bytes.
57. Input devices are used to provide the steps and tasks the computer needs to process data, and these steps and tasks are called _____.
58. A computer gathers data, processes it, outputs the data or information, and _____ the data or information.
59. The binary language consists of two digits: _____ and _____.
60. A string of _____ 0s and 1s is called a byte.
61. The devices you use to enter data into a computer system are known as _____ devices.
62. The devices on a computer system that let you see the processed information are known as _____ devices.
63. _____ is the set of computer instructions or programs that enables the hardware to perform different tasks.
64. When you connect to the _____, your computer is communicating with a server at your Internet service provider (ISP).

65. _____ are computers that excel at executing many different computer programs at the same time.

66. _____is the application of computer systems and techniques to gather legal evidence.

67. _____ is the science that attempts to create machines that will emulate the human thought process.

68. Macintosh computers use the Macintosh operating system (Mac OS), whereas PCs generally run _____ as an operating system.

69. A process known as _____ tracks trends and allows retailers to respond to consumer buying patterns.

70. Hard disk drives and CD drives are examples of _____ devices.

71. You would use _____ software to create spreadsheets, type documents, and edit photos.

72. _____ are computers that support hundreds or thousands of users simultaneously.

73. _____ is the term given to the act of stealing someone's identity and ruining their credit rating.

74. Surgeons are using _____ to guide robots to perform delicate surgery.

75. Patient _____ are life-sized mannequins that have a pulse and a heartbeat and respond to procedures just like humans.

True and False

76. Currently, the performance of tasks by robots is based on preprogrammed algorithms.

77. Data can be a number, a word, a picture, or a sound.

78. Strictly defined, a computer is a data processing device.

79. The discrepancy between the *haves* • *and have-nots* • *with regard to computer technology* is commonly referred to as the digital society.

80. One of the benefits of becoming computer fluent is being a savvy computer user and consumer and knowing how to avoid viruses, the programs that pose threats to computer security.

Multiple Choice MS Word (General)

Microsoft Word Practice
Set 01

1. Which of the following is not valid version of MS Office?
 A) Office XP
 B) Office Vista
 C) Office 2007
 D) None of above
2. You cannot close MS Word application by
 A) Choosing File menu then Exit submenu
 B) Press Alt+F4
 C) Click X button on title bar
 D) From File menu choose Close submenu
3. The key F12 opens a
 A) Save As dialog box
 B) Open dialog box
 C) Save dialog box
 D) Close dialog box
4. What is the short cut key to open the Open dialog box?
 A) F12
 B) Shift F12
 C) Alt + F12
 D) Ctrl + F12
5. A feature of MS Word that saves the document automatically after certain interval is available on
 A) Save tab on Options dialog box

 B) Save As dialog box
 C) Both of above
 D) None of above

6. Where can you find the horizontal split bar on MS Word screen?
 A) On the left of horizontal scroll bar
 B) On the right of horizontal scroll bar
 C) On the top of vertical scroll bar
 D) On the bottom of vertical scroll bar
7. Which of the following is not available on the Ruler of MS Word screen?
 A) Tab stop box
 B) Left Indent
 C) Right Indent
 D) Center Indent
 E) All of them are available on ruler
8. What is place to the left of horizontal scroll bar?
 A) Tab stop buttons
 B) View buttons
 C) Split buttons
 D) Indicators
 E) None of above
9. Which file starts MS Word?

A) Winword.exe
B) Word.exe
C) Msword.exe
D) Word2003.exe

10. How many ways you can save a document?
 A) 3
 B) 4
 C) 5
 D) 6

11. If you want to keep track of different editions of a document which features will you use?
 A) Editions
 B) Versions
 C) Track Change
 D) All of above

12. Background color or effects applied on a document is not visible in
 A) Web layout view
 B) Print Layout view
 C) Reading View
 D) Print Preview

13. What is a portion of a document in which you set certain page formatting options?
 A) Page
 B) Document
 C) Section
 D) Page Setup

14. Borders can be applied to
 A) Cells
 B) Paragraph
 C) Text
 D) All of above

15. Which of the following is not a type of page margin?
 A) Left
 B) Right

C) Center
D) Top

16. What is the default left margin in Word 2003 document?
 A) 1"
 B) 1.25"
 C) 1.5"
 D) 2"

17. What is gutter margin?
 A) Margin that is added to the left margin when printing
 B) Margin that is added to right margin when printing
 C) Margin that is added to the binding side of page when printing
 D) Margin that is added to the outside of the page when printing

18. Portrait and Landscape are
 A) Page Orientation
 B) Paper Size
 C) Page Layout
 D) All of above

19. If you need to change the typeface of a document, which menu will you choose?
 A) Edit
 B) View
 C) Format
 D) Tools

20. Which of the following is not a font style?
 A) Bold
 B) Italics
 C) Regular
 D) Superscript

Answers
1-B, 2-D, 3-A, 4-D, 5-A, 6-C, 7-D, 8-B, 9-A, 10-A, 11-B, 12-D, 13-C,

14-D, 15-C, 16-B, 17-C, 18-A, 19-C, 20-D,

Microsoft Word Practice
Set 02

1. Pressing F8 key for three times selects
 A) A word
 B) A sentence
 C) A paragraph
 D) Entire document

2. What happens if you press Ctrl + Shift + F8?
 A) It activates extended selection
 B) It activates the rectangular selection
 C) It selects the paragraph on which the insertion line is.
 D) None of above

3. How can you disable extended selection mode?
 A) Press F8 again to disable
 B) Press Del to disable
 C) Press Esc to disable
 D) Press Enter to disable

4. What does EXT indicator on status bar of MS Word indicate?
 A) It indicates whether the external text is pasted on document or not
 B) It indicates whether extended add-ons are installed on MS Word or not
 C) It indicates whether Extended Selection mode is turned on or off
 D) None of above

5. What is the maximum number of lines you can set for a drop cap?
 A) 3
 B) 10
 C) 15
 D) 20

6. What is the default number of lines to drop for drop cap?
 A) 3
 B) 10
 C) 15
 D) 20

7. What is the shortcut key you can press to create a copyright symbol?
 A) Alt+Ctrl+C
 B) Alt + C
 C) Ctrl + C
 D) Ctrl + Shift + C

8. How many columns can you insert in a word document in maximum?
 A) 35
 B) 45
 C) 55
 D) 65

9. What is the smallest and largest font size available in Font Size tool on formatting toolbar?
 A) 8 and 72
 B) 8 and 64
 C) 12 and 72
 D) None of above

10. What is the maximum font size you can apply for any character?
 A) 163
 B) 1638
 C) 16038
 D) None of above

11. Which of the following is graphics solution for Word Processors?
 A) Clipart
 B) WordArt
 C) Drop Cap

D) All of above

12. The keystrokes Ctrl + I is used to
 A) Increase font size
 B) Inserts a line break
 C) Indicate the text should be bold
 D) Applies italic format to selected text

13. A character that is raised and smaller above the baseline is known as
 A) Outlined
 B) Raised
 C) Superscript
 D) Subscript

14. What is the purpose of inserting header and footer in document?
 A) To enhance the overall appearance of the document
 B) To mark the starting and ending of page
 C) To make large document more readable
 D) To allow page headers and footers appear on document when printed

15. Which of the following function key activates the speller?
 A) F5
 B) F7
 C) F9
 D) Shift + F7

16. The minimum number of rows and columns in MS Word document is
 A) 1 and 1
 B) 2 and 1
 C) 2 and 2
 D) None of above

17. Thesaurus tool in MS Word is used for
 A) Spelling suggestions
 B) Grammar options
 C) Synonyms and Antonyms words
 D) All of above

18. Why Drop Caps are used in document?
 A) To drop all the capital letters
 B) To automatically begin each paragraph with capital letter
 C) To begin a paragraph with a large dropped initial capital letter
 D) None of above

19. A bookmark is an item or location in document that you identify as a name for future reference. Which of the following task is accomplished by using bookmarks?
 A) To add anchors in web page
 B) To mark the ending of a paragraph of document
 C) To quickly jump to specific location in document
 D) To add hyperlinks in webpage

20. A word processor would most likely be used to do
 A) Keep an account of money spent
 B) Do a computer search in media center
 C) Maintain an inventory
 D) Type a biography

Answers
1-B, 2-B, 3-C, 4-C, 5-B, 6-A, 7-A, 8-B, 9-A, 10-B, 11-A, 12-D, 13-C, 14-D, 15-B, 16-A, 17-C, 18-C, 19-C, 20-D,

Microsoft Word Practice
Set 03

1. What happens when you click on Insert >> Picture >> Clip Art
 A) It inserts a clipart picture into document
 B) It lets you choose clipart to insert into document
 C) It opens Clip Art taskbar
 D) None of above
2. Which option is not available in Insert Table Autofit behavior?
 A) Fixed Column Width
 B) AutoFit to Contents
 C) Autofit to Window
 D) Autofit to Column
3. To autofit the width of column
 A) Double click the right border of column
 B) Double click the left border of column
 C) Double click the column header
 D) All of above
4. From which menu you can insert Header and Footer?
 A) Insert Menu
 B) View Menu
 C) Format menu
 D) Tools Menu
5. After typing header text, how can you quickly enter footer text?
 A) Press PageDown key and type the text for footer
 B) Click on Switch between Heder & Footer then type the text
 C) Both of above
 D) None of above

6. When inserting Page number in footer it appeared 1 but you wish to show a. How can you do that?
 A) From format menu choose bullets and Numbering and configure necessary setting
 B) From Insert menu choose Page Number and specify necessary setting
 C) Click on Page Number Format tool and specify required setting
 D) All of above
7. Which of the following statement is false?
 A) You can set different header footer for even and odd pages
 B) You can set different page number formats for different sections
 C) You can set different header footer for first page of a section
 D) You can set different header and footer for last page of a section
8. Where can you change the vertical alignment?
 A) Formatting toolbar
 B) Paragraph dialog box
 C) Page Setup dialog box
 D) Standard toolbar
9. To get to the 'Symbol' dialog box, click on the _____ menu and choose 'Symbol'.
 A) Insert
 B) Format
 C) Tools
 D) Table
10. Which of the following symbol sets would be most likely to contain a mathematical symbol such as a

degree sign, greater than or equal to, or a Greek letter?

A) Wingdings
B) Wingdings 3
C) Webdings
D) Symbol

11. When assigning a shortcut key to a symbol, you should always try to select a key or key combination that is:

A) unassigned
B) Located on the ten-key pad section of your keyboard.
C) Assigned to another task.
D) From the same font family as the symbol.

12. Suppose you wanted to create an AutoCorrect entry that would type the words 'We regret to inform you that your submission has been declined' Of the following choices, which would be the best name you could assign to this entry?

A) Regret
B) Subdual
C) We regret to inform you that your submission has been declined
D) 11

13. If you want to convert a symbol or several lines of text into an AutoCorrect entry, you should:

A) Insert the symbol or type the text in a Word document first. Then, select the text or symbol and go to the AutoCorrect dialog box.
B) Click the Tools menu and choose AutoCorrect Options. Then, click the Insert menu and choose Symbol (or click the Format menu and choose Paragraph) to add the symbol or paragraph to AutoCorrect.
C) AutoCorrect can only accommodate one line of text. It is not possible to convert a symbol or multiple lines of text into an AutoCorrect entry.
D) Insert the symbol or type the text in a Word document first. Then, select the text or symbol and click the Edit menu followed by Paste Special. Select New AutoCorrect Entry and then click OK.

14. AutoCorrect was originally designed to replace _____ words as you type.

A) Short, repetitive
B) Grammatically incorrect
C) Misspelled
D) None of the above

15. Which of the following is the second step in creating a macro?

A) Start recording
B) Using your mouse or keyboard, perform the task you want to automate
C) Assign a keyboard shortcut to the macro
D) Give the macro a name

16. If you will be displaying or printing your document on another computer, you'll want to make sure and select the _____ option under the 'Save' tab.

A) Embed Fonts
B) Embed True Type Fonts
C) Save True Type Fonts
D) Save Fonts

17. In Word, the mailing list is known as the _____.

A) Data sheet
B) Source
C) Data source
D) Sheet

18. Which of the following is not one of the three 'Mail Merge Helper' steps?
A) Merge the two files
B) Create the main document
C) Set the mailing list parameters
D) Create the data source

19. Which of the following button will allow you to add, delete, or change records in your Data Source?
A) 'Data Source' button
B) 'Edit' button
C) 'Edit Data Source' button
D) 'Data editing' button

20. It is possible to _____ a data source before performing a merge.
A) Create
B) Modify
C) Sort
D) all of the above

Answers
1-C, 2-D, 3-A, 4-B, 5-B, 6-C, 7-D, 8-C, 9-A, 10-D, 11-A, 12-B, 13-A, 14-C, 15-C, 16-B, 17-C, 18-C, 19-C, 20-D,

Microsoft Word Practice
Set 04

1. What is the default font size of a new Word document based on Normal template?
A) 10 pt
B) 12 pt
C) 14 pt

D) None of above

2. What is the default font used in MS Word document?
A) Times New Roman
B) Arial
C) Algerian
D) Preeti

3. Which tab in Font dialog box contains options to apply font effects?
A) Font tab
B) Character Spacing
C) Text Effects
D) Standard Toolbar

4. If you need to double underline a word, how will you do that?
A) Go to Format menu and then Font option. Open Underline Style and choose Double Underline
B) From Format menu choose Font option and then from Font tab open Underline Style and select Double Underline
C) Select the text then choose Format >> Font and on Font tab open Underline Style and choose Double Underline
D) Click double underline tool on formatting toolbar

5. DropCap means
A) All Caps
B) Small Caps
C) Title case
D) None of above

6. What is the short cut key to open Font dialog box?
A) Ctrl + F
B) Alt + Ctrl + F
C) Ctrl + D
D) Ctrl + Shift + D

7. How can you access the font size tool on formatting toolbar?
 A) Ctrl + S
 B) Ctrl + Shift + S
 C) Ctrl + P
 D) Ctrl + Shift + P
8. How can you make the selected character superscripted?
 A) Ctrl + =
 B) Ctrl + Shift + =
 C) Alt + Ctrl + Shift + =
 D) None of above
9. What does Ctrl + = key effect?
 A) Superscript
 B) Subscript
 C) All Caps
 D) Shadow
10. What happens if you mark on Hidden check box of Font dialog box after you select some text?
 A) The text is deleted from document and you need to bring from Recycle Bin if required again.
 B) The text is hidden and you need to bring it by removing the check box if needed again
 C) The text is deleted and cannot be returned back
 D) The text is hidden and cannot be returned back
11. How can you increase the font size of selected text by one point every time?
 A) By pressing Ctrl +]
 B) By pressing Ctrl + [
 C) By pressing Ctrl + }
 D) By pressing Ctrl + {
12. Which of the following line spacing is invalid?
 A) Single
 B) Double
 C) Triple
 D) Multiple
13. How can you apply exactly the same formatting you did to another text?
 A) Copy the text and paste in new location. Then type the new text again.
 B) Copy the text and click on Paste Special tool on new place
 C) Select the text then click on Format Painter and select the new text
 D) All of above
14. What should you do if you require pasting the same format in many places?
 A) Click the Format painter and go on pasting in many places holding Alt Key
 B) Double click the format painter then go on pasting in many places
 C) Click the format painter then go on pasting to many places holding Ctrl Key
 D) All of above
15. On which toolbar can you find Format Painter tool?
 A) Standard toolbar
 B) Formatting toolbar
 C) Drawing Toolbar
 D) Picture Toolbar
16. Which indent marker controls all the lines except first line?
 A) First Line Indent Marker
 B) Left Indent Marker
 C) Hanging Indent Marker
 D) Right Indent Marker

Information Communication Technology (ICT)

17. How can you remove tab stop markers from ruler?

A) Double click the tab marker and choose Clear All

B) Drag the tab stop marker out of the ruler

C) Right click the tab stop marker and choose remove

D) All of above

18. Which operation you will perform if you need to move a block of text?

A) Copy and Paste

B) Cut and Paste

C) Paste and Delete

D) Paste and Cut

19. What is the extension of Word files?

A) FIL

B) DOT

C) DOC

D) TXT

20. Which of the following option is not available in Insert >> Picture?

A) Chart

B) Word Art

C) Clip Art

D) Graph

Answers

1-B, 2-A, 3-A, 4-C, 5-D, 6-C, 7-D, 8-B, 9-B, 10-B, 11-A, 12-C, 13-C, 14-B, 15-A, 16-B, 17-B, 18-B, 19-C, 20-D,

Microsoft Word Practice Set 05

1. To insert a drop cap in one of the paragraph you should access

A) Insert Menu

B) Format

C) Tools

D) None of above

2. How many different positions can you set for drop cap?

A) 1

B) 2

C) 4

D) 6

3. What is the maximum number of lines you can set for lines to drop box?

A) 3

B) 5

C) 10

D) 15

4. Which of the following can NOT be used to create parallel style column?

A) Format Tabs

B) Table Insert Table

C) Insert Textbox

D) Format Columns

5. Which of the following is used to create newspaper style columns?

A) Format Tabs

B) Table Insert Table

C) Insert Textbox

D) Format Columns

6. Columns dialog box can be opened from

A) Format menu Columns submenu

B) Double click on column space in ruler

C) Press Alt + O + C

D) All of above

7. You can jump to the next column by

A) Clicking with your mouse on the next column
B) Press Alt + Down-arrow
C) Both of above
D) None of Above

8. How can you break the current column and start a new column immediately?
A) Press Ctrl + Shift + Enter
B) Press Alt + Enter
C) Press Ctrl + Enter
D) Press Alt + Shift + Enter

9. What is the smallest width of a column?
A) 0"
B) 0.5"
C) 1"
D) 1.5"

10. If the number of columns is selected 1 and the line between check box is marked, where is the line drawn?
A) in the left margin
B) in the right margin
C) both in left and right margin
D) None of Above

11. The other Col# are inactive when you've select 3 columns. How will you activate those boxes?
A) double click on spacing box
B) double click on inactive Col#
C) Remove mark from Line between checkbox
D) Remove mark from Equal Column Width check box

12. How much space in minimum must be provided between columns?
A) 0"
B) 0.5"
C) 1"

D) 1.5"

13. To open Columns dialog box quickly
A) double click on the left margin area of ruler
B) double click the space between area on ruler
C) double click the right margin in ruler
D) All of above

14. Which of the following command is not available in Tools menu?
A) Auto text
B) Autocorrect
C) Auto summarize
D) Macro

15. To move the cursor page to page of document
A) Ctrl+PgDn
B) Ctrl+PgUp
C) Both of above
D) None of above

16. Text boundary can be displayed or hidden from
A) Auto text option from Insert menu
B) Options from Tools menu
C) Customize from Tools menu
D) All of above

17. Which of the following are word processing software?
A) WordPerfect
B) Easy Word
C) MS Word
D) All of above

18. MS Office provides help in many ways, which of these is one of them?
A) What is this?

B) Office Assistant
C) Help menu
D) All of the above
19. You wished to justify text over the height of paper, which option will you choose
A) Page Setup from File menu
B) Paragraph from Format menu
C) From formatting toolbar
D) Font from Format menu
20. Which of the following is not of the merge process?
A) Sort the data source records
B) Format a main document
C) Edit a data source
D) Merge the two files to print or create a new document

Answers
1-B, 2-B, 3-C, 4-D, 5-D, 6-D, 7-C, 8-A, 9-B, 10-D, 11-D, 12-A, 13-B, 14-A, 15-C, 16-B, 17-D, 18-D, 19-A, 20-A,

Microsoft Word Practice
Set 06

1. There can be many ways to insert page number in a document. Which of the following lets you insert page number?
A) Page number from Insert menu
B) Page Setup from file menu
C) Footnote from Insert menu
D) Both a & c
2. Which is not a data source component?
A) mail merge toolbar
B) header row
C) data fields
D) data records
3. Which of the following is not the part of standard office suite?
A) Word Processor
B) Database
C) Image Editor
D) File manager
4. Where can you find the Draw Table tool button?
A) Standard toolbar
B) Formatting toolbar
C) Drawing toolbar
D) Tables and Formatting toolbar
5. Which of the following option in File pull down menu is used to close a MS Word document?
A) Quit
B) Close
C) Exit
D) New
6. You need to jump to the next column breaking current column right at the cursor position. How can you break column?
A) Pressing Ctrl+Enter
B) Pressing Alt+Shift+Enter
C) Break command from Insert menu
D) Both b and c
7. Superscript, subscript, outline, emboss, engrave are known as
A) font styles
B) font effects
C) word art
D) text effects
8. Shimmer, Sparkle text, Blinking Background etc. are known as
A) font styles
B) font effects
C) word art

D) text effects

9. The feature of Word that automatically adjusts the amount of space between certain combination of characters so that an entire word looks more evenly spaced. What is that feature called?

A) Spacing

B) Scaling

C) Kerning

D) Positioning

10. Which of the following is not available in Font Spacing?

A) Normal

B) Loosely

C) Condensed

D) Expanded

11. Which of the following position is not available for fonts on MS Word?

A) Normal

B) Raised

C) Lowered

D) Centered

12. What is the maximum scale percentage available in Scale drop down box?

A) 500

B) 200

C) 100

D) 90

13. Bold, Italic, Regular are known as

A) font styles

B) font effects

C) word art

D) text effects

14. Uppercase on Change Case dialog box and All Caps on Fonts dialog box both converts selected text into Capital Letters. What's the difference between the two?

A) Both are same. They are only two different ways of capitalize text.

B) It is faster to convert from Change Case than from Font dialog box

C) Change Case makes conversion permanent but All Caps on Font can always be reverted

D) All Caps on Font dialog box makes the change permanent where Change Case can be always reverted

15. If you need to hide some paragraphs, how can you do it?

A) From Paragraph dialog box

B) From Font dialog box

C) From Options Dialog box

D) None of above

16. Which of the following is the latest version of MS Word?

A) Word 2000

B) Word 2007

C) Word 2010

D) Word 2011

17. Changing the appearance of a document is called

A) Proofing

B) Editing

C) Formatting

D) All of above

18. In a document what is the maximum number of columns that can be inserted in MS Word Table?

A) 35

B) 15

C) 63

D) 65

19. You can detect spelling and grammar errors by

A) Press Shift + F7
B) Press Ctrl + F7
C) Press Alt+ F7
D) Press F7

20. A screen element of MS Word that is usually located below the title bar that provides categorized options is
A) Menu mar
B) Tool Bar
C) Status Bar
D) All of the above

Answers
1-A, 2-A, 3-D, 4-D, 5-B, 6-C, 7-B, 8-D, 9-C, 10-B, 11-D, 12-B, 13-A, 14-C, 15-B, 16-C, 17-C, 18-C, 19-D, 20-A,

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