DATA PROCESSING

Scheme of work for 2016 SS Three Extension

Class

1. History of computing
   - Early computations
   - Counting devices
   - Classification of computers by generations
     - First generation
     - Second generation
     - Third generation
     - Fourth generation
     - Fifth generation
   - Classification of computers by types
   - Classification of computers by degree of versatility/functionality
   - Number systems
   - Data representations
   - Binary coding system scheme

2. Digitalization of data
   - Digitalization process
   - Benefits of digitalization
   - History of computer development
   - Types of computers
   - Components of computers
   - Computer Hardware
   - Computer Software

3. Data and information
   - Data
   - Types of data
   - Sources of data
   - Information
WEEK 1. HISTORY OF COMPUTING ---- REFER TO YOUR SS ONE NOTE

Assignment 1. Classify computer according to its types, describe each type with examples.

Assignment 2. Described computer based on its degree of versatility or functionality
NUMBER SYSTEM
The number system has been developed hundreds of years ago in order to use them to represent data and hence help in data processing by using them for calculations.
Commonly used number systems include
1. The decimal system (base 10): This is used in everyday activities. It ranges from 0-9
2. The binary system (base 2): It's digits are 0 and 1
3. The octal system (base 8): Its ranges from 0-7. It is occasionally used in computing
4. The hexadecimal system (base 16): Its digits are 0-9 and A-F

DATA REPRESENTATION
All data on digital computers are represented as a sequence of Os' and 1s.
This includes numeric data, text, executable files, images, audio and video.
Data representation is basically the different encoding schemes used internally to represent the information transferred or stored inside the computer. The various methods used are; ASCII, EBCDIC and Unicode

BINARY CODING SCHEMES
Binary coding scheme is a method used for representing all of the digits’ letters, special characters and symbols using the binary digits Os and 1s.
Three types of binary coding schemes are;

ASCII: Stands for American Standard Code for Information Interchange. This is the most widely used binary code for microcomputers.

EBCDIC: Stands for Extended Binary Coded Decimal Interchange Code. It was developed by IBM and is used for primarily for large computers.

Unicode: It is 16-bits code design to support international languages such as Chinese and Japanese. It was developed by Unicode Inc. with support from Apple, IBM and Microsoft.
BITS
A bit is acronym for **binary digit**.
A bit is the smallest unit of data or information in a computer. It has single binary of 0 or 1 which conforms to the internal representation of data in a computer.

BYTES
A byte is made up of 8 bits and is the measurement unit used to describe the storage capacity and transfer rate of digital system.
Most computers used byte to represent a character such as a letter, numbers or special characters. One character occupies 8 bits of memory.

**DIGITALIZATION OF DATA**

**INTRODUCTION**

Digitalization is the process of converting information (object, image, sound, document or a signal usually an analog signal) into digital format. In this format, information is organized into discrete unit of data (called bits) that can be separately addressed usually in multiple bit groups called **bytes**. This is the binary data computers and many devices with computing capacity can...
Process. Text and images can be digitalized, for instance, a scanner captures and image (which may be an image of text) and converts it to an image file. Digitizing information makes it easier to preserve access and share. For example, an original historical document may only be accessible to people who visit it physical location, but if the document content is digitalized, it can be made available to people worldwide.

**DEFINITION**

Data digitalization is the process of converting information (text, images, video and audio) into digital format. Digitalizing simply means capturing an analog signal into a digital form.

**Data Digitalization Process**

The term digitalization is often used when diverse forms of information such as text, sound, image or voice are converted into a single binary code. Digitalization occurs in two parts.

**Benefits of Data Digitalization**

- Long term preservation of documents
- Orderly archiving of documents
- Easy & Customized access to information
- Easy information dissemination through images text, CD-ROMS, Internet, intranets and extranets

**Assignment 3.** State two characteristics of each generation of computers.

**ICT Application in everyday life**  Refer to your ss one note

**INFORMATION PROCESSING**

**THE ART OF INFORMATION PROCESSING**

**INTRODUCTION**

Information is data that has been processed in such a way that it is meaningful to the person who receives it. Information is also referring to facts and opinions provided and received during the course of daily life.

Information processing is the change of information in any manner detectable by any
observer. As such it is a process that describes everything that happens (changes) in the universe from the falling of a rock to the printing of a text file from a digital computer system.

**DEFINITION**
Information processing is the process of acquiring, obtaining, recording, organizing, Storing and dissemination of information.

OR

Information processing refers to the manipulation of digitalized information by computers and other digital electronic equipment.

**PROCEDURES FOR INFORMATION PROCESSING**
The procedures for information processing can be categorized into;

1. Collation of information
2. Organisation of information
3. Analysis of information
4. Interpretation of information

**1. COLLATION OF INFORMATION**: Collation is the assembly of written information into a standard order. Many systems of collation are based on numerical order or alphabetical order. Collation is a fundamental element of most office filling systems, library catalogs and reference books

**Benefits of collation**

i. It makes it faster and easy for a user to find an element in the list or to confirm that it is absent from the list.

ii. Search operation can be done automatically using the binary search or manual searching.

iii. The first and last element can be easily found in a given range.

**2. ORGANIZATION OF INFORMATION**: Organizing skills helps in arranging information in such a way that it can be used more effectively. This essentially involves the following:

1. Comparing and contrasting
2. Classifying perceptions
3. Ordering perceptions/events
4. Representing ideas/perceptions

**The nine basic ways of organizing information are:**

1. Alphabet
2. Category
3. Continuum
4. Location
5. Time
6. Hierarchy
7. Chronological
8. Geographical
9. Value Size
3. ANALYSIS OF INFORMATION: Since information is the raw material of decision making, it is crucial to learn how to analyze it. Analysis part may be adding up numbers and averaging them or comparing information to examine the relationship of one thing to another or two things together.

Two ways to analyze information are:
- a.) Tally sheets
- b.) Summary sheets

4. INTERPRETATION OF INFORMATION: During the interpretation stage, searchers assess the usefulness of their information and reflect to develop personal meaning. Information requires interpretation to become knowledge.

Interpretation of information involves the following:
1) Inferring
2) Drawing conclusions
3) Filtering information (point of view bias etc.)
4) Comparing and contrasting
5) Determining credibility
6) Classifying
7) Evaluating information
8) Evaluating information to support or result a problem or research question

INFORMATION TRANSMISSION

INTRODUCTION
Information transmission refers to the transmission or transfer of information from one location to another. Information can be viewed as a sequence of symbols that can be interpreted as a message. Information can be recorded as signs or transmitted as signals.

Without information being passed from one generation to another, human history could have been forgotten.

DEFINITION
Information transmission is the process of passing or sending information or knowledge from one part or person to another through a channel.

COMPLETE INFORMATION TRANSMISSION SYSTEM
Method of information transmissions are;

- Ancient Method.
- Modern method.

**ANCIENT METHOD OF INFORMATION TRANSMISSION**

These are the method used by our ancestors for transmitting information. They include:

1. **Oral Method** - In the ancient days people used oral method to disseminate information. In this method, a person uses his mouth to tell others what the information is all about.

2. **Drum Beating** - This is the beating of drums or gong by the information bearer to arouse the attention of audience/recovers and at the same time disseminating the information. This method is used in rural areas or villages.

3. **Fire lighting** - In this method, fire is lit to indicate the presence of someone at a particular place or as warning signal of an approaching enemy.

4. **Town Crying** - A town Cryer is a person who is employed by a town council or community leader to make public announcements in the streets. They carry a bell or gong to attract people’s attention before making their announcement.

5. **Whistling** - The whistling sound is used to draw the attention of people before the message is delivered.

6. **Drawing Diagrams** - People draw diagram to show the message they are passing across to the other party.

**MODERN METHOD OF INFORMATION TRANSMISSION**

These are the methods of transmitting information in this modern era. The modern methods can be categorized into two main groups. They are; Electronic means and Non Electronic means.

1. **Electronic Means of Information Transmission** - These are means of transmitting information through gadgets or devices that require electricity. Examples include: Telephone, Telex, Radio, Television Satellite, Computer, GSM, Internet.

2. **Non Electronic Means of Information Transmission** - These are ways of communicating through non-electronic sources such as letter, reports and memorandums. Before the invention of electricity, communication was slow and difficult. Some messages took days, weeks and even months to arrive at its destination. The non-electronic means include; Typing, Drawing, Writing, Signs.
OPERATING SYSTEM

An operating system is a suite of programs that controls, monitors and coordinate the execution of all other programs. It is the software responsible for the control and allocation of hardware resources on the computer system.

The operating system acts as an interface between the user and the computer hardware.

It serves as platform on which other application program runs.

It hosts several applications that runs on a computer and handles the operations of the computer hardware. It controls the way software uses hardware.

Operating System manages the following resources:

- Processors /memory
- Primary and secondary storage
- Input/output devices
- Data/information
- Programs

FUNCTIONS OF OPERATING SYSTEMS

The functions of operating system include:

- Resources Allocation
- Controlling and monitoring hardware resources
- Protecting hardware, software and data
- Diagnosing disk Errors
- Formatting new Disk
- Control of Utility software
- Monitors the status of hardware devices
- Executes disc reading and writing operation
- It handles control of multiprogramming

Examples of operating systems are:

- MSDOS—Microsoft Disk Operating System
- PCDOS—Personal Computer Disk Operating System
- Unix
Types of operating systems

There are five types of operating systems based on the types of computer they control and the sort of application they support; they are:

1. Single-User, Single Task: This operating system is designed to manage the computer so that one user can effectively do one thing at a time. Examples include Palm OS for palm-handled computers, PCDOS, MSDOS, OS 2.

2. Single-User Multitasking: This operating system allows a single user to have several programs in operation at the same time. It is mostly used on desktop and laptops. Examples are Ms Windows, Mac OS, Linux.

3. Multi-User Operating Systems: This allows many different users to share computer resources simultaneously. It also allows for more than one task at a time. Examples include Xenix, Unix, VMS, Mainframe OS etc.

4. Networking Operating System: A networking operating system is a computer operating system that is designed primarily to support workstations and personal computers that are connected to a local area network (LAN). It provides printer sharing, file sharing, application sharing and the ability to manage a network name directory, security, account administration for users, backing up data and other housekeeping aspects of a network. Examples include Windows NT, Windows Server 2003, Windows Server 2009 etc.

5. Embedded Operating System: These operating systems are designed to be used in embedded computer systems. They are designed to operate on small machines like PDAs, blackberry, Iphone, Android phones etc. They are able to operate with limited number of resources. Examples are Minix 3, Windows CE etc.