IT FOR STATISTICS.

TOPIC 1: INTRODUCTION TO IT

1. Information technology is the use of computers to collect, store and process data into meaningful information.
2. A computer is an electronic device that accepts data, stores, processes it and provides output.

ROLE OF IT IN TODAY'S SOCIETY.

1.COMMUNICATION:IT has revolutionized communication, thus reducing time and cost through e mails, social media and videocalls etc.

2.BUSINESS AND COMMERCE: IT has led to; (i)automation of business processes e.g., payroll and inventory. (ii)improved communication through emails and videoconferencing. (iii)has also helped with decision making using MIS (Management information system) and data analytics. (iv) improves productivity through software tools.

3.EDUCATION: Creation of e-learning platforms, online libraries, computer-based testing and assessments and virtual classrooms and has also enhanced research using databases and statistical tools.

4.HEALTHCARE: Introduction of medical records has created efficiency in patient data management, there is also computer-aided surgeries and medical imaging, hospital management systems for administration and health data analytics for disease prediction.

5.BANKING AND FINANCE: Introduction of online and mobile banking, ATM services and digital systems has improved trade and security, fraud detection using AI and monitoring systems, financial modelling and forecasting has led to increased profits and reduced losses due to risk management.

6.GOVERNMENT: digital systems e.g., *e-citizen* has eased administration and the introduction of online tax filling, license renewal and public records saves time.

7.AGRICULTURE: Precision farming using sensors, Weather forecasting to aid planting/harvesting, Market price information for farmers, Drones for monitoring farms and Automated irrigation systems.

8.TRANSPORTATION & LOGISTICS: GPS systems for navigation and tracking, Traffic management systems, Online ticketing for buses, trains, flights, Supply chain management and route optimi

zation, Self-driving car technologies.

9. **ENTERTAINMENT**: video streaming (Netflix,Youtube), digital music platforms, video games, animation and special effects in movies(CGI), online content creation.

10. **SCIENCE & RESEARCH**: Data analysis using statistical software, Simulation and modeling, Storage and sharing of huge datasets, High-performance computing (supercomputers), Online research publications.

11. **SECURITY**: Cybersecurity systems for protection, Surveillance systems (CCTV, drones) have all resulted to a decrease in crime rates.

12. **TOURISM**: Creation of online booking systems, Digital marketing, virtual tours and travel apps have boosted the tourism industry.

TOPIC 2: FUNDAMENTALS OF COMPUTER OPERATIONS.

- A computer has 4 main processes; input, processing, storage and output.
- Input is the entry of data or instructions for processing.
- Processing is the conversion of data by a computer into meaningful information through calculations, comparisons etc.
- Storage is the act of saving data and information permanently or temporarily for future use.
- Output is the delivery of already processed information in an understandable form.

TOPIC 3: COMPUTER HARDWARE BASICS.

- This refers to all the physical parts of a computer that can be seen and touched.
- It is Divided into the following categories;

INPUT DEVICES

- Mouse
- Keyboard
- Microphone
- Sensors
- Scanners

OUTPUT DEVICES

- Monitor/Screen

- Speakers
- Headphones
- Projector

SYSTEM UNIT COMPONENTS

- CPU (Central Processing unit): The brain of the computer where data is processed.
- Motherboard: The main circuit board connecting all components.
- RAM (Random Access Memory) : Temporary memory for running programs.
- ROM (Read Only Memory) : Permanent memory for storing system instructions, files and applications.
- PSU (Power Supply Unit): Provides power to the computer.
- Cooling system: Comprises of fans or heat sinks to prevent overheating.

STORAGE DEVICES

- HDD (Hard Disk Drive)
- SSD (Solid State Drive)
- Flash Drive
- Memory Card
- CD
- Cloud Storage

COMMUNICATION DEVICES

- NIC (Network Interface Card)
- Wi-Fi adapters
- Bluetooth Modules
- Modems
- Routers

TOPIC 4: COMPUTER SOFTWARE BASICS.

➢ Refers to a set of programs, instructions, and data that run a computer.

- They are the intangible parts of a computer.
- It is divided into two main categories;

1.SYSTEM SOFTWARE.

- This software manages and controls the computer's Hardware.
- It acts as the bridge between the user and the machine.

TYPES OF SYSTEM SOFTWARE.

- OS (Operating System): Controls all hardware and software e.g., Windows, MacOS, Linux, Android.
- Device Drivers: Help Hardware Devices (printers, keyboards) to communicate with the co mputer.
- Utility Programs: Performs maintenance tasks e.g., antivirus, file compression and disk cleanup.

2.APPLICATION SOFTWARE

- These are programs made for users to complete specific tasks.

EXAMPLES;

- Microsoft Word for typing documents
- Excel for Spreadsheets for managing and calculating data.
- PowerPoint for presentation
- Browsers e.g., Chrome and edge
- Media players e.g., VLC
- Games .etc.

3.PROGRAMMING SOFTWARE.

- These are used by programmers to create other software.

EXAMPLES;

- Python
- Java
- C++

- Code Editors like VS Code

TOPIC 5: DATA AND DATA FILES.

1.DATA

➢ These are raw facts and figures collected to be put into a computer for processing into meaningful information.

➢ We also have signals which are divided into two; Analog and Digital.

- ANALOG SIGNALS.

➢ These are continuous signals that change smoothly to represent information.

CHARACTERISTICS:

- Infinite possible values.
- Represent real-world phenomena like sound, light, or even temperature
- Prone to noise.

EXAMPLE;

- Sound waves from a microphone.

- DIGITAL SIGNALS.

➢ These are discrete signals that use Binary forms (1s and 0s) to represent information

CHARACTERISTICS:

- Only two possible states:0 or 1.
- Are how computer process and store information.
- Easier to store and more reliable.
- Error-resistant.

EXAMPLE:

Keyboard presses and computer files are stored as binary.

CHARACTERISTICS OF DATA:

➢ Raw and unprocessed

➢ Can be numbers, text, symbols, audio or video

➢ Need processing to be meaningful

EXAMPLES;

- Numbers
- Text
- symbols

2.DATA FILES

- ➢ A Data file is a collection of related data stored together on a storage device.
- ➢ Helps a computer organize and retrieve data efficiently.

CHARACTERISTICS OF DATA FILES:

- ➢ Stored Permanently or Temporarily on a Device.
- ➢ Has a file name and file extension.
- ➢ Can contain text, numbers, images, audio or video.

EXAMPLES;

- .docx is a word document.
- .xlsx is an excel spreadsheet.
- .jpg is an image file.
- .mp3 is a music file.

TOPIC 6: DISK STORAGE FUNDAMENTALS.

- Disk storage refers to the devices that store Digital Data permanently so it can be access ed, modified in the future.

1.TYPES OF DISK STORAGE

- HARD DISK DRIVE (HDD)
- Uses magnetic disks(platters) to store data.
- Data is read/written by a moving read/write head.

CHARACTERISTICS:

- Large storage capacities

- Relatively slower compared to SSD
- Less Expensive.

- SOLID STATE DRIVE
- Uses Flash memory chips to store data
- Faster than HDD
- Durable and quiet
- More expensive per GB
- HYBRID DRIVES (SSHD)
- Combines HDD + small SSD cache for speed +large capacity

2.DISK STORAGE CONCEPTS:

- TRACKS-A circular path on a disk
- SECTORS-a subdivision of a track
- CYLINDERS- a group of sectors managed by the operating system
- ACCESS TIME-Time it takes to locate and read/write data.

UNITS OF DATA STORAGE

- BIT-The smallest unit of data storage
- BYTE-Made up of 8 bits
- KILOBYTE-1024 BYTES
- MEGABYTE-1024 KILOBYTES
- GIGABYTES-1024 MEGABYTES
- TERABYTES-1024 GIGABYTES
- PETABYTE-1024 TERABYTES