

1. History and Generations of Computers

1. Pre-History and Early Inventions

Before the era of electronic computers, several mechanical and electro-mechanical devices laid the foundation for computation.

- **Abacus:** This is considered the earliest calculating device.
- **Napier's Bones:** Invented by **John Napier**, this device utilized numbered rods to perform multiplication and division, a method known as *Rabdologia*.
- **The Analytical Engine:** Conceptualized by **Charles Babbage**, this machine utilized "Counter wheels" as a memory unit.
- **MARK-1:** Invented by **Howard Hathaway Aiken**, the MARK-1 holds the distinction of being the first electro-mechanical computer.

2. Generations of Computers

The evolution of computers is officially categorized into generations based on the technological components used for processing and storage.

First Generation (1940-1956)

- **Core Technology:** This generation relied on **Vacuum Tubes** for circuitry,.
- **Programming:** Operated using **Machine Language**.
- **Processing Type:** Primarily used **Batch Processing**, .
- **Notable Computers:**
 - **ENIAC (Electronic Numerical Integrator and Computer):** The first programmable, general-purpose electronic digital computer.
 - **UNIVAC:** The first computer made available for commercial use, .
 - **EDSAC:** Notable for being the first computer to provide storage.
 - **Others:** IBM 650 .

Second Generation (1956-1963)

- **Core Technology:** Characterized by the replacement of vacuum tubes with **Transistors**.
- **Notable Computers:**
 - IBM 1400 .
 - CDC 3600 .

Third Generation

- **Core Technology:** Defined by the use of **Integrated Circuits (IC)**, .
- **Notable Computers:**
 - **IBM 360 Series:** A prominent mainframe series, .
 - **IBM 370 and Honeywell 6000**, .
 - **PDP**, .

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Fourth Generation

- **Core Technology:** Defined by the use of the **Microprocessor** as a switching device.
- **Interface:** This generation saw the widespread adoption of the **GUI (Graphical User Interface)**.
- **Notable Computers:**
 - **Cray-1:** A famous early supercomputer introduced in 1976.
 - **L2 Star 2000** and **Cray X-MP** .
 - **Altair 8800:** Considered the first microcomputer (1975). (Note: If "Micral" (1973) is listed, it takes precedence).

Fifth Generation

- **Core Technology:** Focuses on **Artificial Intelligence (AI)** and **ULSI (Ultra Large Scale Integration)**.
- **Alternative Name:** Also known as **KIPS (Knowledge Information Processing System)**.
- **Notable Computers:**
 - **Param 1000** .
 - **Intel P4** .
 - Modern **Laptops** .

3. Supercomputers: A Historical Timeline

Supercomputers represent the pinnacle of processing power in computer history.

- **The First Supercomputer:** The **CDC 6600**, designed by **Seymour Cray** in 1960 at CDC, is considered the world's first supercomputer,, .
- **Indian Milestones:**
 - **Param Padma:** India's first supercomputer.
 - **SAGA-220:** Developed by ISRO.
 - **AIRAWAT (2025):** Currently the fastest AI supercomputer in India, developed by **C-DAC (Centre for Development of Advanced Computing)**. It ranks 75th globally,.
- **Global Speed Records (2025):**
 - **El Capitan:** Developed by the USA, this is currently the fastest supercomputer in the world, achieving a performance of roughly **1.8 Exaflops**.
 - **Frontier:** Also noted as a fastest supercomputer in the listings.

4. Key Figures in Computer History

Several pioneers are recognized for their foundational contributions:

- **Charles Babbage:** Known as the "Father of the Computer".
- **Lady Ada Lovelace:** Recognized as the **World's First Programmer**.
- **John von Neumann:** Developed the basic architecture of the computer and the concept of storage,.
- **John McCarthy:** The Father of **Artificial Intelligence (AI)**.
- **J.C.R. Licklider:** The founder/father of **Cloud Computing**.
- **Tim Berners-Lee:** Inventor of the **World Wide Web (WWW)**.
- **Ray Tomlinson:** Universally recognized as the "Father of Email" (1971),.

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- **V.A. Shiva Ayyadurai:** An Indian-American scientist who developed an inter-office mail system in 1978 and holds the copyright for the term "EMAIL".
 - **Vint Cerf:** Known as the "Father of the Internet".
 - **Radia Perlman:** Known as the "Mother of the Internet" (developed Spanning Tree Protocol).
 - **Robert Heath Dennard:** Inventor of **RAM and ROM**.
 - **Chuck Hull:** Founder/inventor of the **3D printer**.
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5. Software and Internet History

- **Internet Origins:**
 - **ARPANET:** The precursor to the Internet, an early packet-switching network.
 - **First Browser:** The very first web browser was called **WorldWideWeb** (later Nexus),.
 - **First Graphical Browser: Mosaic**,.
 - **First Commercial Browser: Netscape**.
 - **Search Engines: Archie** is considered the first internet search engine.
- **Malware History:**
 - **First Virus: Creeper**, created by **Bob Thomas**.
 - **First Antivirus: Reaper**, designed specifically to delete Creeper.
 - **First Boot Sector Virus: Brain** (infected floppy disks),.
 - **First Ransomware: The AIDS Trojan (PC Cyborg)**, created by **Joseph Popp** in 1989,.
- **Artificial Intelligence:**
 - **First Chatbot: ELIZA** is considered the first chatbot in computer science history.
 - **First AI Humanoid Robot: Sophia**.
 - **First AI Language: LISP** (List Processing).

2. Computer Architecture (Hardware, CPU, Memory)

I. Central Processing Unit (CPU)

The CPU is the primary component of a computer, often referred to as the **brain** of the system. It is responsible for the "Process" stage of the Input-Process-Output-Storage (IPOS) cycle.

1. Core Components

- **Arithmetic Logic Unit (ALU):** This unit is responsible for the actual execution of instructions. It performs mathematical calculations and logical operations. The **Accumulator** is a special register within the ALU that stores intermediate results of these operations,.,
- **Control Unit (CU):** This unit acts as the director of processor operations, decoding instructions and coordinating other units,.
- **Memory Unit (Registers):** Registers are high-speed storage locations located directly inside the CPU. They are the fastest type of memory available to the computer,.
 - **Composition:** A register is made up of a collection of **Flip-flops**, which are circuits capable of storing one bit of data,.

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- **Specific Registers:**
 - **Program Counter (PC):** Keeps track of the next instruction to be executed.
 - **Memory Address Register (MAR):** Holds the address of the active memory location.
 - **Flags:** Registers that hold conditional codes.

2. Processing and Performance

- **Speed Measurement:** Processor speed is measured in **Hertz (Hz)**,. It is also measured in **MIPS** (Millions of Instructions Per Second),.
 - **Supercomputing:** The speed of supercomputers is measured in **FLOPS** (Floating Point Operations Per Second),.
 - **Parallel Processing:** Modern CPUs have **Cores** that allow for parallel processing and improved multitasking. GPUs (Graphics Processing Units) also excel at parallel processing tasks.
 - **Instruction Execution:** The time between program input and output is known as **Execution Time**.
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II. Memory Architecture

Memory is categorized by its speed and proximity to the CPU. The hierarchy from fastest to slowest is: **Registers > Cache > RAM > SSD > Hard Disk**,.

1. Primary Memory (Main Memory) Primary memory interacts directly with the CPU.

- **RAM (Random Access Memory):**
 - **Characteristics:** It is a semiconductor-based, volatile memory, meaning data is lost when power is turned off,,. It allows for simultaneous read and write operations.
 - **SRAM (Static RAM):** Fast memory used to create **Cache Memory**. It does not require refreshing and retains data as long as power is supplied,,.
 - **DRAM (Dynamic RAM):** Slower than SRAM and requires frequent refreshing (many times per second),. This is the standard RAM used in laptops and mobile phones (specifically LPDDR),.
 - **SDRAM (Synchronous DRAM):** A type of DRAM that synchronizes with the system clock,,.
- **ROM (Read Only Memory):**
 - **Characteristics:** Non-volatile memory used to store **Firmware**, such as the **BIOS** (Basic Input Output System) and the **Bootstrap Loader** needed to start the computer,,.
 - **MROM (Mask ROM):** Programmed by the manufacturer during production and cannot be changed,,.
 - **PROM (Programmable ROM):** Can be programmed only once by the user.
 - **EPROM (Erasable PROM):** Can be erased using **Ultra-Violet (UV) light**,.
 - **EEPROM (Electrically Erasable PROM):** Can be erased electronically; used in Flash memory,,.

2. Cache Memory

- **Function:** An extremely high-speed buffer located between the CPU and Main Memory (RAM),.
- **Purpose:** It speeds up processing by storing frequently accessed data, utilizing the **Principle of Locality of Reference**,.

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- **Composition:** It is typically made of Static RAM (SRAM),.

3. Secondary Storage (Auxiliary Memory) Also known as secondary storage, these devices are used for permanent data retention.

- **Hard Disk Drive (HDD):**
 - **Structure:** Coated with magnetic metallic oxide. Data is stored in **Tracks** and **Sectors**. A **Sector** is the smallest accessible unit on the disk,.
 - **Performance:** Speed is primarily impacted by **RPM** (Revolutions Per Minute). Access time consists of **Seek Time** (time to read/write). It is generally the slowest component for accessing data compared to RAM or SSDs.
- **SSD (Solid State Drive):** Uses **NAND-based Flash memory** technology. Its speed is measured in **Bytes per second**.
- **Flash Memory:** A form of EEPROM used in USB drives (Pen Drives) and memory cards,. Pen drives are also known as Flash Drives. Flash memory is erased in blocks or sectors.
- **Optical Storage:**
 - **CD (Compact Disc):** Drives contain a laser,.
 - **CD-R:** A blank disc that can be written to once but read many times,.
- **Magnetic Tape:** Provides **sequential access** only, unlike the random access of disks.

4. Virtual Memory

- A memory management technique that extends storage capacity beyond the actual size of the main memory by using space on the **Hard Drive**,.

III. Hardware and Peripherals

1. Motherboard and System Components

- **Motherboard:** The main circuit board connecting the CPU, memory, and peripherals.
- **CMOS Battery:** Keeps the system clock (date and time) running when the PC is turned off,.
- **SMPS (Switch Mode Power Supply):** Delivers power to components at appropriate voltages.

2. Input Devices

- **Keyboard:** Uses the **ANSI** standard to convert keystrokes into bits. **Toggle Keys** (e.g., Caps Lock, Num Lock) provide sound cues when pressed,.
- **Scanner:** Converts physical text or images into digital formats.
- **OMR (Optical Mark Reader):** Senses hand-drawn marks like circles on pre-printed forms.
- **Webcam:** An input device used for video capture,.
- **Microphone:** Invented by Emile Berliner.

3. Output Devices

- **Printers:**
 - **Laser Printer:** A non-impact printer that uses a laser beam and dry ink powder (toner),.
 - **Dot Matrix Printer:** The first type of computer printer; an impact printer.
 - **Plotters:** Used for printing large engineering designs, maps, and 3D illustrations,.

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- **Metrics:** Speed is measured in **PPM** (Pages Per Minute),. Quality is measured in **DPI** (Dots Per Inch),.
- **Monitors:** Connect to the CPU via buses like SCSI.

4. Dual-Purpose Devices (Input/Output)

- **Modem:** Modulates and demodulates signals (Digital <-> Analog),.
- **NIC (Network Interface Card):** Enables network connection and contains the physical **MAC Address**,.
- **Headsets/Touchscreens:** Function as both input and output.

5. Ports and Connectivity

- **USB (Universal Serial Bus):** Used for connecting external devices like hard disks and pen drives. Versions 1.0 and 2.0 use **Half Duplex** communication.
- **HDMI:** Interface for uncompressed video and audio,.
- **Ethernet:** Uses **RJ-45** connectors,.
- **Telephone Line:** Uses **RJ-11** connectors to connect modems.
- **Legacy Ports:** **Parallel Ports** were used for printers, and **Serial Ports** are also known as COM ports.

IV. Data Representation

- **Units of Memory:**
 - **Bit:** The smallest unit (0 or 1).
 - **Nibble:** 4 bits,.
 - **Byte:** 8 bits,.
 - **Hierarchy:** Bit < Nibble < Byte < KB < MB < GB < TB < PB < EB < ZB.
 - **Conversion:** 1 Megabyte (MB) = 1024 Kilobytes (KB).
- **Number Systems:**
 - **Binary:** Base 2 system used by computers.
 - **Hexadecimal:** Base 16 system, extensively used in microprocessors and MAC addresses,.
 - **ASCII:** American Standard Code for Information Interchange, used for encoding text/email messages,.
- **Logic Gates:** The **NAND** and **NOR** gates are known as Universal Gates,.

3. Software and Operating Systems

I. Overview of Software Categories

Software is generally categorized into three main types based on function:

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- **System Software:** Controls internal computer operations and includes the Operating System, Device Drivers, and Linkers. It also includes language translators like Compilers and Interpreters .
 - **Application Software:** Designed for end-users to perform specific tasks, such as creating documents (MS Word), browsing the web, or editing photos (Photoshop).
 - **Utility Software:** Designed to analyze, configure, optimize, and maintain the computer system. Examples include Antivirus software, Disk Cleanup tools, and Backup utilities,.
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II. Operating Systems (OS)

The Operating System is a critical system software that functions as an interface between the user and the hardware, responsible for resource management.

A. Core Concepts & Functions

- **Kernel:** This is the central component or "core" of the Operating System that manages computer and hardware operations , .
- **Bootting:** The process of loading the OS into RAM is called bootting .
 - **Cold Bootting:** Starting a computer from a powered-off state .
 - **Warm Bootting:** Restarting a computer that is already on .
 - **Hard Bootting:** Booting by pressing the power button .
- **Firmware:** Software stored permanently in ROM (Read Only Memory), such as the BIOS (Basic Input Output System), is called Firmware, , . The BIOS contains the **Bootstrap Loader**, the initial program needed to start the computer.

B. Types of Operating Systems

- **Time-sharing:** Allows multiple tasks or users to use the system simultaneously.
- **Real-Time OS (RTOS):** Designed for immediate processing.
- **Batch Processing:** Processes jobs in groups or batches, mainly used in First Generation computers, .
- **Embedded OS:** Operating systems used in mobile phones, cars, and robotics are categorized as Embedded Operating Systems, .

C. Specific Operating Systems

- **Microsoft Windows:**
 - **Windows 95:** Introduced the Start Menu and Taskbar .
 - **Windows 10:** Introduced the concept of "Windows as a Service" . It was released in 2015 and support ends in 2025 . It supports the NTFS file system.
 - **Windows 11:** Launched in October 2021. It requires a minimum 1 GHz processor and 4GB RAM . A key feature is "Snap Layout" for arranging applications .
 - **Shortcuts:** Win + E opens Windows/File Explorer ; Win + I opens Settings ; Shift + Delete permanently deletes a file, bypassing the Recycle Bin .
- **Linux:** An open-source operating system, meaning its source code is free to view and modify. It is a multi-user, multi-processing, and multi-tasking system.
- **Unix:** A software known for its exclusive feature called "Shell" . It is *not* an open-source OS .
- **Mobile OS:**

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- **Android:** An open-source OS , . The official app store is the Play Store. The latest version (as of Feb 2024) is Android 15, codenamed "Vanilla Ice Cream" .
 - **Other:** Apple's mobile OS is iOS, and its spreadsheet software is called Numbers.
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III. Language Translators

Translators are system software used to convert high-level programming code into machine-readable code .

- **Compiler:** Translates the *entire* high-level code into machine (object) code at once, reporting errors after scanning the whole program,, .
 - **Interpreter:** Translates and executes the program line-by-line at run time,, .
 - **Assembler:** Converts assembly language specifically into machine code.
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IV. Application Software: Microsoft Office

Microsoft Office 365 is a subscription-based service written in C++,,, .

A. Microsoft Word (Word Processor)

- **Function:** Used to create text-based documents.
- **Formatting:**
 - **Margins:** Default is 1 inch . Includes "Gutter Margin" for binding space.
 - **Fonts:** Default in 2021 is Calibri; newer versions use Aptos, . Font size ranges from 1 to 1638, .
 - **Case Options:** Five types available (e.g., Sentence case, tOGGLE cASE), . Shift + F3 switches between cases .
 - **Drop Cap:** Default is 3 lines, maximum is 10 lines , .
- **Key Shortcuts:**
 - **Editing:** Ctrl+C (Copy), Ctrl+V (Paste), Ctrl+X (Cut), Ctrl+Z (Undo), Ctrl+Q (Remove Paragraph Formatting) .
 - **Alignment:** Ctrl+E (Center),, .
 - **Tools:** F7 (Spelling/Grammar) , ; Shift+F7 (Thesaurus),, ; Ctrl+H or F5 (Find and Replace), , , ; Ctrl+K (Hyperlink) , .
 - **Breaks:** Ctrl+Enter (Page Break), ; Shift+Enter (Line Break), ; Enter (Paragraph Break) .
 - **Other:** Ctrl+T creates a Hanging Indent , . F12 opens "Save As" .

B. Microsoft Excel (Spreadsheet)

- **Structure:** A workbook contains worksheets (default 1, max 255 added) , , . The default file name is "Book1", .
- **Cells & Data:**
 - **Limits:** A cell can hold 32,767 characters . A worksheet has 1,048,576 rows.
 - **References:** Absolute (\$A\$9), Relative (A9), and Mixed (\$A9 or A\$9),,,, , .

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- **Alignment:** Text is left-aligned; numbers (including date/time) are right-aligned by default , .
- **Formulas & Functions:**
 - All formulas start with =, .
 - **Functions:** SUM adds a sequence; NOW() enters current date and time, , , ; FLOOR rounds down and CEILING rounds up to the nearest multiple , ; TRANSPOSE switches rows and columns.
 - **Shortcuts:** Shift+F3 inserts a function ; Shift+F11 inserts a new worksheet ; Ctrl+0 hides columns, Ctrl+9 hides rows, .

C. Microsoft PowerPoint (Presentation)

- **Views:** Has multiple views, including Slide Sorter (to see all slides), and Slide Master (for global formatting), .
- **Presentation:** F5 starts the show from the beginning; Shift+F5 starts from the current slide,, . Alt+F5 opens Presenter View, , .
- **Creation:** Ctrl+M inserts a new slide,, . Ctrl+N creates a new presentation file .
- **Features:** Transitions are effects between slides, . The "Rehearse Timings" feature is in the Slide Show tab . Font sizes range from 1 to 3600 .

V. Utility and Security Software

A. Utility Software These programs enhance performance or maintain the system. Examples include:

- **Antivirus:** Protects against malware (e.g., McAfee, BitDefender),, , .
- **Maintenance:** Disk Cleanup, Disk Defragmenter, and Backup software, .

B. Malicious Software (Malware) Malware includes various threats designed to harm systems:

- **Virus:** Requires human activation (like clicking a file) to replicate. "Brain" was the first boot sector virus, , . "Retro Virus" actively attacks antivirus programs , .
- **Worm:** Standalone malware that self-replicates and spreads via networks without human intervention (e.g., Code Red), , .
- **Trojan Horse:** Disguises itself as useful software to trick users but contains malicious code. It does not replicate,, , , .
- **Ransomware:** Encrypts data and demands payment (often Bitcoin) for the key (e.g., WannaCry, Petya, Locky). Joseph Popp is considered its founder,, , , .
- **Spyware:** Monitors user activity and transmits information , .
- **Adware:** Created to generate revenue through advertisements, .
- **Rootkit:** grants a hacker full control (admin rights) of a system while remaining undetected , .

VI. Software Distribution & Licensing

- **Open Source:** Source code is free to view and modify. Examples include Linux, Android, Ubuntu, Mozilla Firefox, and MySQL,, , , , .

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- **Proprietary:** Source code is kept secret (e.g., Windows, macOS).
 - **Shareware/Trialware:** Software available for a trial basis before purchase, , .
 - **Freeware:** Software that is completely free .
 - **Subscription Service:** Microsoft 365 is an example of software offered as a subscription service.
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VII. Web Browsers and Internet Software

- **Browsers:** Software used to access the web.
 - **Mosaic:** The first graphical web browser, , .
 - **Netscape:** The first commercial web browser .
 - **Tor (The Onion Router):** A free, open-source browser used for privacy and the Dark Web; it uses DuckDuckGo as its default search engine, , .
 - **Google Chrome:** Uses `Ctrl+T` for a new tab, , `Ctrl+J` for downloads, , and `Ctrl+Shift+N` for Incognito mode .
- **Search Engines:** Websites like Google, Bing, and Baidu (China) , . **Archie** is considered the first internet search engine . **Ecosia** is a search engine based in Berlin that plants trees , .
- **Email:** Uses protocols like SMTP (sending) and POP3/IMAP (receiving), , . Microsoft Outlook is a common email client software.

4. Database Management System (DBMS)

1. Core Definitions

- **Database:** A database is defined as an organized collection of structured information.
- **DBMS:** This stands for Database Management System, which is the software used to create and manage databases.
- **Open Source Examples: MySQL** is an example of an open-source DBMS. It is considered the most most open-source DBMS.

2. Data Hierarchy

Data within a database environment is organized in a specific ascending order of complexity:

1. **Bit** (The smallest unit).
2. **Character**.
3. **Field** (In the database hierarchy, a Field comes after a Byte/Character).
4. **Record**.
5. **File**.
6. **Database**.

3. The Relational Model (RDBMS)

Most modern systems rely on the Relational Model, which structures data into 2-dimensional tables.

- **Relations:** Data is stored in **2D Tables**, which are technically referred to as Relations.

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- **Tuple:** A Row or Record in a table is known as a Tuple.
- **Attribute:** A Column or Field in a table is known as an Attribute.
- **Founder: Dr. E.F. Codd** proposed the 12 rules for Relational Database Management Systems (RDBMS).

4. Database Keys

Keys are essential for identifying data and establishing connections between tables.

- **Primary Key:** This key uniquely identifies each record in a table and cannot be NULL.
- **Foreign Key:** This key is used to represent the relationship between tables.

5. SQL Commands (Structured Query Language)

SQL is used to interact with the DBMS and is categorized into specific types of commands based on their function:

A. DDL (Data Definition Language) These commands define the structure of the database.

- **CREATE.**
- **ALTER.**
- **DROP:** This command is used to permanently remove a database table.
- **TRUNCATE:** This removes all records and space from a table.

B. DML (Data Manipulation Language) These commands are used to manage the data itself.

- **SELECT.**
- **INSERT.**
- **UPDATE.**
- **DELETE.**

C. DCL (Data Control Language) These commands handle permissions and access control.

- **GRANT.**
- **REVOKE.**

6. Transaction Management (ACID Properties)

To ensure data integrity, database transactions must adhere to **ACID** properties:

- **Atomicity:** Ensures that all operations within a transaction execute, or none of them do.
- **Consistency:** Ensures the database remains in a consistent state after a transaction.
- **Durability:** Ensures that updates are permanent, even if the system fails. (*Note: Isolation is part of ACID but is not explicitly defined in the provided text excerpts, though implied by the acronym.*)

7. Advanced Concepts and Tools

- **Normalization:** The process of reducing redundancy in a database.
- **Trigger:** Code that is automatically executed in response to certain events.

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- **Data Mining:** The process of searching for patterns within data.
- **MS Access:**
 - In MS Access, a **Table Name** must be unique within a database.
 - When saving a project, the file format used is **.adp**.

5. Networking and Internet

1. History and Fundamentals

- **Origins:** The **ARPANET** (Advanced Research Projects Agency Network) is considered the precursor to the modern Internet and was an early packet-switching network.
- **Key Figures:**
 - **Tim Berners-Lee** is the inventor of the **World Wide Web (WWW)**.
 - **Ray Tomlinson** is universally recognized as the "Father of Email," having introduced the concept in 1971, . However, **V.A. Shiva Ayyadurai** is an Indian-American scientist who holds the copyright for the term "EMAIL" and developed an inter-office mail system in 1978 .
 - **Vint Cerf** is known as the Father of the Internet .
 - **Radia Perlman** is known as the "Mother of the Internet" for developing the Spanning Tree Protocol .
- **Definitions:**
 - **Internet:** The **WAN (Wide Area Network)** is the best example of the Internet .
 - **IoT (Internet of Things):** An umbrella term coined by Kevin Ashton in 1999 referring to any object (like home appliances) connected to the Internet, .
 - **Web 3.0:** A decentralized form of the Internet where users enjoy control over their data .

2. The OSI Model (Open Systems Interconnection)

The OSI model structures communication into seven layers:

- **Layer 1: Physical Layer:** Transmits raw bit streams. It includes network topologies like Bus, Star, and Ring .
- **Layer 2: Data Link Layer:** Responsible for error-free transport of data frames , . It handles physical addressing (**MAC addresses**), . Devices like Bridges and Switches operate here , .
- **Layer 3: Network Layer:** Handles routing, packets, and IP addressing. Routers operate at this layer to determine the best path for data,, .
- **Layer 4: Transport Layer:** Protocols like **TCP** and **UDP** operate here . The Protocol Data Unit (PDU) for this layer is called a **Segment** .
- **Layer 5: Session Layer:** Manages sessions between applications .
- **Layer 7: Application Layer:** This is the layer closest to the end-user, providing the user interface, . Email services work on this layer , .

3. Network Hardware

- **NIC (Network Interface Card):** A card installed in a computer to connect it to a network. It acts as both an input and output device and contains a unique physical **MAC address**, .
- **Modem:** Stands for **Modulator-Demodulator**. It converts digital signals to analog (modulation) and vice versa (demodulation),, . It connects via telephone lines (RJ-11).

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- **Router:** A device essential for WANs that uses an IP routing table to forward packets and determine the best path for data, .
- **Switch:** A unicast device that filters and forwards traffic using **MAC addresses**, . It can handle many ports .
- **Hub:** A **broadcast device** that sends data to all connected ports regardless of the target, .
- **Bridge:** Connects networks using similar protocols and recognizes Layer 2 (MAC) addresses, . It typically has only two ports .
- **Gateway:** Also known as a **Protocol Converter** or **Proxy Server**, it connects different networks or protocols, , , .
- **Repeater:** A Layer 1 device used to extend the length of a network by regenerating signals to prevent degradation, .

4. Network Topologies

- **Bus Topology:** Uses a single central cable (backbone) to connect all devices. It is a multipoint connection, , , .
- **Star Topology:** All nodes connect to a central switch or hub. It is commonly used in LANs with switches and is the easiest for adding new nodes, , .
- **Ring Topology:** Data travels around in a circle; a short message called a **Token** is used to control communication, .
- **Mesh Topology:** Every node connects to every other node. It offers the highest fault tolerance but has the highest installation/maintenance cost and requires the most wiring, , , . The formula for the number of links is $n(n-1)/2$.
- **Tree Topology:** Organized hierarchically, associated with the Physical Layer .

5. Protocols and Ports

- **TCP/IP (Transmission Control Protocol/Internet Protocol):** The foundation of the Internet and most networks, , , .
- **HTTP/HTTPS:** **HTTP** (Hypertext Transfer Protocol) is the foundation of the WWW. **HTTPS** (Secure) uses **Port 443**, while HTTP uses **Port 80**, , .
- **Email Protocols:**
 - **SMTP (Simple Mail Transfer Protocol):** Used for **sending** mail, . It uses **Port 25**, .
 - **POP3 (Post Office Protocol v3):** Used for **receiving/retrieving** mail, . It is best for accessing mail from a **single device**, . It uses **Port 110**, , .
 - **IMAP (Internet Message Access Protocol):** Used for receiving mail on **multiple devices**, . It uses **Port 143**, .
 - **MIME (Multimedia Internet Mail Extensions):** Allows the transfer of multimedia/non-ASCII data in emails, , .
- **UDP (User Datagram Protocol):** A connectionless, unreliable protocol used for sending data where speed is prioritized over reliability, .
- **DHCP (Dynamic Host Configuration Protocol):** Automates the assignment of IP addresses to devices on a network, .
- **Telnet:** Used for remote login and terminal connection, .
- **FTP/SFTP:** **SFTP** (Secure File Transfer Protocol) adds security to file transfers .
- **ARP/RARP:**
 - **ARP (Address Resolution Protocol):** Finds the MAC address when the IP is known, , .
 - **RARP (Reverse ARP):** Finds the IP address when the MAC address is known, , , .
- **ICMP:** A Network layer protocol used to diagnose communication issues (e.g., Ping) .

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6. Addressing (IP and MAC)

- **MAC Address (Media Access Control):** A hardware address found on the NIC. It is **48 bits** (6 bytes) long, written in **Hexadecimal**, and used for Ethernet connections., , , .
- **IP Address (Internet Protocol):**
 - **IPv4:** Uses **32 bits** (4 bytes) and **Dotted Decimal** notation, , , .
 - **IPv6:** Developed by **IETF** to solve address exhaustion. It uses **128 bits** and Hexadecimal notation, , , , .
- **IP Classes (IPv4):**
 - **Class A, B, C:** Reserved for **Unicast** communication, .
 - Class A includes addresses like 10.x.x.x .
 - Class B ranges from 128 to 191 (e.g., 129.x.x.x), .
 - **Class D:** Reserved for **Multicasting**.
 - **Class E:** Reserved for future use/research,.
- **Special Addresses:**
 - **Loopback Address: 127.0.0.1** (also called Localhost) is used for self-testing the IP stack, , , .
- **Assignment:** IP addresses are assigned by **IANA** (Internet Assigned Numbers Authority) , .

7. Internet Concepts and Tools

- **URL (Uniform Resource Locator):** The address used to locate resources on the web, . The first part specifies the **Protocol**.
- **Browsers & Search Engines:**
 - **Mosaic** was the first graphical web browser, .
 - **Netscape** was the first commercial browser .
 - **Archie** is considered the first search engine .
 - **Tor Browser:** The most used browser for the **Dark Web**; it uses **DuckDuckGo** as its default search engine, , .
 - **Cookies:** Text files stored on the client (browser) to track user activity or return visits, , . **Zombie Cookies** recreate themselves after deletion .
- **Network Types:**
 - **PAN (Personal Area Network):** Includes technology like **Bluetooth** (IEEE 802.15.1) , , .
 - **Extranet:** A private network allowing trusted third parties (shareholders, partners) access , , .
 - **Intranet:** Accessible only by employees within an organization .
 - **VPN (Virtual Private Network):** Creates a secure, private network over a public one using encryption and protocols like **PPTP**, , . It masks the IP address .

8. Security and Threats

- **Malware Types:**
 - **Virus:** Requires human action to spread. **Creaper** was the first virus; **Reaper** was the first antivirus , , . **Brain** was the first boot sector virus, .
 - **Worm:** Self-replicating and spreads automatically without human intervention (e.g., Code Red), , .
 - **Trojan Horse:** Disguises itself as useful software but contains malicious code; it does not replicate,, , . **I LOVE YOU** was a damaging Trojan .

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- **Ransomware:** Encrypts files and demands payment (often Bitcoin). Examples include **WannaCry, Petya, Locky, and Bad Rabbit**, . **Joseph Popp** is considered the founder (AIDS Trojan),, .
- **Spyware:** Monitors user activity , .
- **Rootkit:** Grants hackers administrative control (root access) while remaining undetected .
- **Attacks:**
 - **Phishing:** Falsifying identity to steal credentials/info,, , . **Vishing** is phishing via telephone (voice) .
 - **Spoofing:** Falsifying a website or attempting to change an IP/DNS to trick a network,, , .
 - **DDoS (Distributed Denial of Service):** Flooding a server with requests using Botnets to shut it down, , .
 - **Sniffing:** Monitoring and capturing packets passing through a network .
- **Defenses:**
 - **Firewall:** Hardware/software that monitors and blocks unauthorized traffic, , .
 - **Encryption:** Converts Plaintext to Ciphertext.
 - **Digital Signature:** Ensures non-repudiation (sender cannot deny sending).

9. Miscellaneous

- **Communication Modes:**
 - **Simplex:** One-way (e.g., Radio, TV Remote) , .
 - **Half Duplex:** Two-way, but one at a time (e.g., Walkie Talkie, Internet Browsing, USB 1.0/2.0) , , .
 - **Full Duplex:** Simultaneous two-way (e.g., Mobile phones, USB 3.0) , .
- **Ethernet Standard:** IEEE 802.3, , .
- **Wi-Fi Standard:** IEEE 802.11 , .
- **Token Ring Standard:** IEEE 802.5 , .

6. Microsoft Word

1. Introduction and Basics

Microsoft Word is a type of **Application Software** specifically categorized as a **Word Processor**, designed to create and manage text-based documents,.

- **Developers:** The "Fathers of MS Word" are **Charles Simonyi and Richard Brodie**.
- **File Extensions:** A pre-formatted document or template in Word saves with the extension **.dotx**.
- **Interface:**
 - **Status Bar:** The Zoom option is located here.
 - **Views:** MS Word 2021 offers **5 different views:** Read Mode, Print Layout, Web Layout, Outline, and Draft.
 - **Gridlines:** Can be found under the **View Tab** (similar to Excel).

2. Formatting and Page Setup

Fonts and Text

- **Default Font:**
 - In MS Word 2021, the default font is **Calibri**,.

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- In 2024/later versions, the new default font is **Aptos**.
- **Font Size:**
 - **Dropdown List:** The available range in the interface dropdown is **8 to 72**.
 - **Maximum Limit:** The maximum font size you can manually apply to a character is **1638**.
 - **Minimum Limit:** The minimum font size is **1**.
- **Font Effects:** There are **7 types** of font effects available (e.g., Strikethrough, Double Strikethrough, Small Caps, Hidden).
- **Change Case:** There are **5 types** of case options: Sentence case, lowercase, UPPERCASE, Capitalize Each Word, and tOGGLE cASE.

Paragraphs and Alignment

- **Alignment:** Text is Left-aligned by default. **Center Alignment** is achieved using **Ctrl + E**.
- **Indentation:** This refers to the space left between the margin and the start of a paragraph.
 - **Hanging Indent:** Created using **Ctrl + T**, this indents all lines of a paragraph except the first one.
- **Drop Cap:** A feature to make the initial letter large.
 - **Maximum lines:** 10.
 - **Default lines:** 3.
 - **Minimum lines:** 1.

Page Layout

- **Orientation:** The document prints in **Portrait** mode by default. The other option is **Landscape**.
- **Margins:**
 - **Default:** Set to **1 inch** in MS Word 2021.
 - **Gutter Margin:** The space added specifically for binding.
 - **Types:** Valid margins include Top, Bottom, Left, Right, and Gutter. There is **no "Center"** margin.
- **Tables:** The maximum number of columns you can insert in a table is **63**.

3. Features and Tools

- **Mail Merge:** A feature found under the **Mailings** tab used to send the same document or letter to multiple different addresses.
- **Reviewing Tools:**
 - **Spelling:** A **red line** under text indicates a spelling error.
 - **Thesaurus:** A tool used to find **synonyms and antonyms**. It is located in the **Review Tab**, along with Spelling and Workbook Statistics.
 - **Word Count:** Located in the Review tab or accessed via shortcut.
- **References:**
 - **Footnotes:** The "Insert Footnote" option is found on the **References Tab**.
 - **Captions & Citations:** Insert Caption, Cross Reference, Citation, and Bibliography are also visible under the **References Tab**.
- **Macros:** Automate repetitive tasks using the **Visual Basic** programming language.
- **Zoom:** The maximum zoom level in MS Word is **500%**.
- **Watermark:** Faint text placed behind the content of the document.

4. Keyboard Shortcuts

File & System:

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- **F12**: Open "Save As".
- **Ctrl + N**: Open a new document.
- **Ctrl + Alt + Delete**: Reboot the computer.

Editing & Clipboard:

- **Ctrl + C**: Copy.
- **Ctrl + V**: Paste.
- **Ctrl + X**: Cut.
- **Ctrl + Z**: Undo.
- **F4**: Repeat the last command or action,.
- **Ctrl + Shift + C**: Copy Formatting.

Formatting:

- **Ctrl + B**: Bold.
- **Ctrl + I**: Italic.
- **Ctrl + Shift + F**: Change Font (or Ctrl + D).
- **Ctrl + Shift + +**: Superscript (e.g., \$x²\$),.
- **Ctrl + =**: Subscript (e.g., \$H₂O\$).
- **Shift + F3**: Switch text between Upper, Lower, and Title case (Change Case).
- **Ctrl + Q**: Remove Paragraph Formatting.
- **Ctrl + 1**: Apply Single Spacing.
- **Ctrl + 5**: Apply/Remove Strikethrough.

Navigation & Selection:

- **F5**: Opens the Find and Replace box,.
- **Ctrl + H**: Opens the Find and Replace dialog box,.
- **F8 (pressed 3 times)**: Selects a sentence.
- **Ctrl + Shift + G**: Opens the Word Count Dialog box,.

Insertions:

- **Shift + Alt + D**: Insert Current Date.
- **Ctrl + Alt + F**: Insert Footnote.
- **Ctrl + Alt + D**: Insert Endnote.
- **Ctrl + K**: Insert Hyperlink,.

Breaks:

- **Ctrl + Enter**: Page Break,.
- **Shift + Enter**: Line Break,,.
- **Enter**: Paragraph Break,.

Proofing:

- **F7**: Spelling and Grammar check,.
- **Shift + F7**: Thesaurus (Synonyms/Antonyms),,.

7. Microsoft Excel

1. Introduction and General Information

- **Definition:** Microsoft Excel is a type of **Application Software**, specifically designed for tasks involving spreadsheets and data management.
- **Purpose:** It is used for organizing data, performing calculations, and visualization. It is part of the **Microsoft 365** subscription service,.
- **Alternative Software:** The Apple equivalent of spreadsheet software is called **Numbers**,. The first electronic spreadsheet ever created for microcomputers was **VisiCalc**,.
- **File Information:**
 - The default file name for a new Excel file is **Book1**,.
 - A file is referred to as a **Workbook**, which is a collection of **Worksheets**.
 - Excel files, along with other Office files, can be infected by **Macro Viruses**,.

2. Worksheet Structure and Dimensions

- **Workbook Limits:**
 - By default, modern Excel versions (like Excel 365) open with **one (1) worksheet**, .
 - The maximum number of worksheets that can be added to a workbook is **255**, .
- **Grid Dimensions (Excel 2021/365):**
 - **Rows:** A single worksheet contains **1,048,576 rows**.
 - **Columns:** The column width can accommodate up to **255 characters**, .
 - **Row Height:** The maximum row height is **409 points**.
- **Cells:**
 - A **Cell** is the intersection of a row and a column.
 - The **Name Box** displays the address of the active cell,.
 - The total number of characters a single cell can contain is **32,767**.
 - **Undo Levels:** You can undo actions up to **100 times** in a worksheet.

3. Data Entry, Formatting, and Interface

- **Data Alignment:**
 - By default, **Date and Time** are **Right Aligned** (because they are treated as numbers), .
 - Text is generally left-aligned by default.
- **Font Styles:**
 - There are **4 types** of font styles: Bold, Italic, Regular (default), and Bold Italic.
 - The supported font size range is **1 to 409**, .
- **Interface Tabs:**
 - **Review Tab:** Contains tools for **Spelling, Thesaurus, Workbook Statistics**, and options to **Protect the Sheet/Workbook**,.
 - **View Tab:** Contains options for **Macros** and to show/hide **Gridlines**.
 - **Worksheet Tabs:** These appear at the bottom of the Excel window.

4. Formulas and Functions

All formulas in Microsoft Excel must start with an **equals sign (=)**,. The maximum limit of available worksheet functions is **341**, .

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Common Functions:

- **SUM:** Used to add a sequence of numbers (e.g., =SUM(A1:A4)).
- **NOW():** Enters both the **current date and time**,, ,.
- **TODAY():** Enters only the **current date**.
- **TRANSPOSE:** Displays row data in a column and vice versa.
- **FLOOR & CEILING:**
 - **FLOOR:** Rounds a number down to the nearest multiple of significance.
 - *Example:* FLOOR(3.7, 2) results in **2**.
 - *Example:* FLOOR(34, 5) results in **30**.
 - **CEILING.MATH:** Rounds a number up. CEILING(3.7, 2) would result in 4.
- **ODD & EVEN:**
 - **ODD(number):** Rounds to the next odd integer. *Example:* ODD(20) = 21.
 - **EVEN(number):** Rounds to the next even integer. *Example:* EVEN(39) = 40.
- **Error Indicators:**
 - Error messages in cells are always preceded by the **Hash symbol (#)**.
 - A **Green Triangle** in the corner of a cell indicates a formula error.

5. Cell Referencing

Excel uses specific symbols to define how cell addresses behave in formulas:

- **Relative Reference:** The default style (e.g., A4).
- **Absolute Reference:** Uses the **Dollar symbol (\$)** to fix both the row and the column so they do not change when copied,
 - *Example:* **\$A\$9**,, , .
- **Mixed Reference:** Uses the dollar sign to fix *either* the row or the column, but not both.
 - *Example:* **\$A4** (Column A is fixed) or **A\$4** (Row 4 is fixed),, , .

6. Advanced Features

- **Macros:**
 - Macros are used to record repetitive tasks and are created using the **Visual Basic** programming language, , .
 - They are accessed via the **View Tab**, .
- **Charts:**
 - **Pie Chart:** Used to show percentage contribution.
 - **Line Chart:** Best used to display data over time.
- **Data Analysis:**
 - **Goal Seek:** A tool used for "What-if Analysis".

7. Keyboard Shortcuts

- **F2:** Edit the selected cell,.
- **F4:** Repeat the last command or action.
- **Shift + F2:** Insert a **Note** in a cell.
- **Shift + F3:** Insert a function, .
- **Shift + F11:** Insert a **New Worksheet**, .
- **Alt + =:** Insert the **Sum Formula** automatically.
- **Alt + Enter:** Enter a new line within the same cell,.

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- **Ctrl + 0:** Hide the selected **Column**.
- **Ctrl + 9:** Hide the selected **Row**.
- **Ctrl + 5:** Apply or remove **Strikethrough**.
- **Ctrl + ; (Semicolon):** Insert current date (Implied by standard Excel functions, though specific source for this shortcut key in the provided text focuses on NOW function; typical Excel usage). *Note: The provided text explicitly mentions formulas for date/time rather than this shortcut key.*
- **Ctrl + H:** Open the **Find and Replace** dialog box.

7. Microsoft Power Point

1. Definition and Core Function

Microsoft PowerPoint is a presentation tool used to create slide shows and present images. It is a key component of the Microsoft Office suite. In the context of alternative software, **Keynote** is the corresponding presentation software used on Apple devices, and **Impress** (part of LibreOffice) is a widely used free, open-source alternative.

2. Slide Structure and Limits

- **Default Slide:** When a new presentation is created, the default first slide is the **Title Slide**.
- **Slide Limits:** There is **no maximum limit** to the number of slides that can be added to a PowerPoint presentation.
- **Creation:** The keyboard shortcut to insert a new slide is **Ctrl + M**.
 - *Note:* This is distinct from **Ctrl + N**, which is used to create a completely new presentation file.

3. Views and Master Slides

PowerPoint offers multiple ways to view and edit a presentation:

- **Total Views:** There are varying counts depending on the version and classification, with sources noting there are **5 presentation views** and **3 Master views** (totaling 8), though another source notes there are **10 views** in PowerPoint 2021.
- **Slide Sorter View:** This view is used to see **all slides at once**, typically in a thumbnail format, making it easier to reorder them.
- **Slide Master View:** This is a crucial feature for design consistency. It controls the look of the **entire presentation**, allowing users to make global changes to fonts, colors, and logos.
- **Presenter View:** This view allows the presenter to see notes and upcoming slides while the audience sees only the current slide. The shortcut to access this is **Alt + F5**.

4. Visuals, Text, and Multimedia

- **Transitions:** These are the special effects that occur when moving from one slide to the next (the effect between slides).
- **Animations:** While transitions apply to slides, animations apply to objects. The **Animation Painter** is a tool used to copy animation settings from one object to another.
- **Sound:** Two specific types of sound effect files that can be added to a presentation are **.wav** and **.mid** (MIDI) files.
- **Fonts:**

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- **Size Range:** The software supports a font size range from **1 to 3600**. However, the default dropdown list in the interface only offers sizes between **Minimum 8** and **Maximum 96**.
- **Shortcuts:** To increase the font size using the keyboard, use **Ctrl + Shift + >**.
- **Grids:** To align objects precisely, you can show or hide the grid using **Shift + F9**.

5. File Extensions and Saving

- **Templates:** A pre-formatted document or presentation template in PowerPoint is saved with the file extension **.potx**.

6. Important Keyboard Shortcuts

- **Start Slideshow (Beginning): F5.**
- **Start Slideshow (Current Slide): Shift + F5.**
- **Presenter View: Alt + F5.**
- **Insert New Slide: Ctrl + M.**
- **Insert Hyperlink: Ctrl + K** (used to add a link to a selected object).
- **Show/Hide Grid: Shift + F9.**

7. Additional Features

- **Rehearse Timings:** This feature, used to practice and record the time spent on each slide, is found under the **Slide Show tab**.
- **Gridlines:** Though often associated with Excel, grid options in PowerPoint are toggled to assist with layout.

8. CYBER SECURITY AND MALWARE

I. Malware (Malicious Software)

Malware is a broad term for harmful software designed to disrupt, damage, or gain unauthorized access to computer systems.

1. Types of Malware

- **Virus (Vital Information Resource Under Siege):**
 - A virus is a program that attaches itself to other programs or files.
 - It requires human action (such as clicking a file or inserting a pen drive) to replicate and spread , .
 - **Macro Virus:** This specific type infects Microsoft Office files like Word documents and Excel spreadsheets, , .
 - **Boot Sector Virus:** Infects the boot sector of storage media like floppy disks. The first boot sector virus was called **Brain**, .
 - **Retro Virus:** A computer virus actively designed to attack antivirus programs, , .
 - **History:** The first virus was the **Creeper** program (created by Bob Thomas), .
- **Worm:**
 - Unlike a virus, a worm is a standalone program that can replicate and spread across a network without any human activation or involvement,, , .
 - **Example:** "Code Red" was a famous self-replicating network worm.

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- **Trojan Horse (Trojan):**
 - This malware disguises itself as useful or legitimate software to fool the user into downloading it, , , , .
 - It does not replicate or reproduce like a virus or worm, .
 - **Example:** The "I LOVE YOU" Trojan (released in 2000) caused massive cyber damage, .
 - **Banking Trojan: SOVA** is a specific Android banking Trojan, .
- **Ransomware:**
 - This malware encrypts user data or locks the system and demands payment (ransom) to restore access, .
 - **Key Figures: Joseph Popp** is considered the founder of ransomware, .
 - **Examples:** The first ransomware was the **AIDS Trojan** (PC Cyborg) in 1989, . Modern examples include **WannaCry, Petya, CryptoLocker, Locky, Bad Rabbit, and TeslaCrypt** , .
- **Spyware:**
 - Software that monitors user activity on the internet and transmits that information to a third party in the background, .
- **Adware:**
 - Malware created specifically to generate revenue for its developer through advertisements, , .
- **Rootkit:**
 - A malicious tool that gives a hacker full administrative (root) control of a system while remaining undetected by antivirus software, , , .
- **Other Specific Threats:**
 - **Cryptojacking:** Malware designed to steal cryptocurrency from a user's wallet, .
 - **Tyupkin:** Malware used to manipulate ATM machines and empty them of cash, .
 - **Web Bug:** A small program embedded inside a GIF image used for tracking, .
 - **Zombie Cookies:** Cookies that automatically recreate themselves after a user deletes them, .

II. Cyber Crimes and Attack Techniques

Attackers use various methods to compromise systems, steal data, or disrupt services.

- **Phishing:**
 - The act of falsifying one's identity or pretending to be a legitimate entity to steal confidential information like usernames, passwords, and credit card details, , , .
 - **Vishing (Voice Phishing):** Phishing conducted via telephone, .
- **Spoofing:**
 - The process where an illegitimate website or user pretends to be a specific legitimate one, .
 - It involves attempting to gain access by changing/falsifying an IP address or DNS, , .
- **DDoS (Distributed Denial of Service):**
 - A cybercrime where attackers flood a server with unnecessary requests to shut it down or make it unavailable, , .
 - This attack utilizes **Botnets** (Robot Networks), .
- **Network Interception:**
 - **Sniffing:** The process of monitoring and capturing data packets passing through a network, .
 - **Eavesdropping:** Listening to, recording, or intercepting private communications, .
 - **Air Cracking:** The process of hacking Wi-Fi (Wireless Fidelity), .
- **Steganography:**
 - The technique of hiding text or data within an image, .

III. Cyber Security Measures and Defenses

To protect against the threats listed above, various hardware, software, and protocols are used.

1. Software and Hardware Tools

- **Firewall:**
 - A security system (hardware and/or software) that monitors and filters network traffic,, .
 - Its primary function is to prevent external access to a system and block hackers, .
- **Antivirus:**
 - A type of **Utility Software** designed to detect and remove malware,, , .
 - **Examples: Kaspersky (Russian),, McAfee, BitDefender, Norton, and Malwarebytes.**
 - **History:** The first antivirus software was **Reaper**, designed to delete the Creeper virus, .
- **VPN (Virtual Private Network):**
 - A technology that creates a private network from a public internet connection, providing online privacy and anonymity,, .
 - It encrypts data and masks the user's IP address, , .
 - **Protocol:** It often uses **PPTP (Point-to-Point Tunneling Protocol),,**
- **Proxy Server:**
 - Acts as an intermediary between a user (workstation) and the internet for security purposes,,
 - It is also known as a **Gateway**,, .

2. Security Protocols and Concepts

- **Encryption:** The process of converting Plaintext into Ciphertext to protect data.
- **HTTPS (Hypertext Transfer Protocol Secure):** Uses **Port 443** to provide secure communication over a network, , .
- **WPA2 (Wi-Fi Protected Access 2):** A widely used security protocol for Wi-Fi networks, .
- **SFTP (Secure File Transfer Protocol):** Adds a layer of security to file transfers, .
- **Digital Signature:** Ensures **Non-Repudiation**, meaning the sender cannot deny sending the message.
- **Patch:** A software update released to fix bugs and security vulnerabilities.
- **CERT (Computer Emergency Response Team):** A group of experts that responds to cybersecurity incidents,.

3. Government Initiatives

- **Sanchar Saathi Portal:**
 - Launched by the **Ministry of Communications** (Minister Ashwini Vaishnaw) in May 2023,.
 - Developed by **DoT (Department of Telecommunications)**.
 - **Objective:** Mobile theft prevention and fraud control, .
 - **Feature:** Uses **CEIR (Central Equipment Identity Register)** to block stolen mobile phones, .

IV. Related Internet Privacy Concepts

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- **Tor (The Onion Router):** The most widely used Dark Web browser. It is free, open-source, and enables anonymous browsing,. Its default search engine is **DuckDuckGo** (known for user privacy),, , .
- **Deep Web:** The part of the World Wide Web not indexed by traditional search engines,.
- **Cookies:** Text files stored on the client (browser) by a server to identify returning users,, , .
- **Digital Divide:** The gap between users who have access/skills for e-government services and computers, and those who do not, .

9. Data Representation- Memory Units-NUMBER SYSTEMS

1. Data Representation and Hierarchy

Computers represent data using a structured hierarchy that builds from the smallest binary units up to complex databases.

- **Data Hierarchy:** The organization of data follows a specific ascending order: **Bit → Character → Field → Record → File → Database**, .
- **The Bit:** The **Bit** is the fundamental unit of data representation.
- **Pixels:** In the context of images, a digital image is comprised of thousands of **Pixels** (Picture Elements) . A single color pixel on a screen is made up of **3 color dots** (RGB - Red, Green, Blue) .
- **Image Types:**
 - **Raster Images (Bitmap):** These represent images using compiled pixels or dots (e.g., .JPG, .GIF) .
 - **Vector Images:** These represent images using mathematical formulas and geometric shapes like lines and curves .

2. Memory Units

Memory units measure the capacity of data storage. The hierarchy is defined by specific groupings of bits.

- **Nibble:** A unit consisting of **4 bits** is called a **Nibble**, .
- **Byte:** A unit consisting of **8 bits** is called a **Byte**.
- **Storage Hierarchy:** The capacity of memory units increases in the following order: **KB < MB < GB < TB < PB < EB < ZB** (Zettabyte is the largest in this specific list).
- **Conversion: 1 Megabyte (MB)** is equivalent to **1024 Kilobytes (KB)**.
- **Word Transfer:** The transfer of data between the **CPU** and **Cache Memory** is referred to as **Word Transfer**, while transfer between **Cache** and **Main Memory (RAM)** is called **Block Transfer** .

3. Number Systems

Computers use various number systems to process and represent data, primarily relying on base-2 (Binary) and its shorthand formats like Hexadecimal and Octal.

A. Binary System (Base 2)

- **Definition:** The **Binary** system works on **Base 2**, utilizing only two digits: **0s and 1s**.
- **Arithmetic Operations:**
 - **Addition:** The binary addition of \$11\$ and \$10\$ results in **101**, .
 - **Subtraction:** The binary subtraction of \$100101\$ (Decimal 37) and \$011110\$ (Decimal 30) results in **000111** (Decimal 7).

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- **Conversion Example:** The decimal equivalent of the binary number \$111111\$ is **63**, .

B. Hexadecimal System (Base 16)

- **Definition:** The **Hexadecimal** system is **Base 16**.
- **Usage:**
 - It serves as a shortcut for representing **4 binary digits** at once.
 - These numbers are used extensively in **microprocessor work** .
 - **MAC Addresses:** A **MAC Address** (Hardware Address) is a **48-bit** address written in **Hexadecimal** format (12 characters),,. It typically uses hyphens or colons for separation .
 - **IPv6:** Internet Protocol version 6 (IPv6) addresses are **128-bit** and written in **Hexadecimal**, .

C. Octal System (Base 8)

- **Conversion (Decimal to Octal):** To convert Decimal **14** to Octal, divide by 8 (14 divided by 8 is 1 with a remainder of 6), resulting in **16**.
- **Conversion (Octal to Binary):** To convert Octal **471** to Binary, each digit is converted to its 3-bit binary equivalent: 4=100, 7=111, 1=001. The result is **100111001**, .

D. BCD (Binary Coded Decimal)

- **Storage:** The number of bits used to store a **BCD digit** is **4 bits** .

4. Character Encoding and Standards

To represent text and keystrokes, computers use standardized encoding systems.

- **ASCII:**
 - Stands for **American Standard Code for Information Interchange**.
 - It is the standard used to convert keystrokes into corresponding bits (unless a specific standard like ANSI is mentioned).
 - Email messages are typically encoded in **ASCII** text .
- **ANSI:** When a key is pressed, the **ANSI** (American National Standards Institute) standard may be used to convert the keystrokes into bits.
- **EBCDIC:** This encoding concept was invented by **IBM** and is primarily used in **Mainframe** computers.
- **MIME:** **MIME** (Multimedia Internet Mail Extensions) is a protocol that allows the transfer of **Non-ASCII data** (such as multimedia files) via email, which was originally designed for ASCII text only, .

10. Artificial Intelligence (AI)

1. Definition and Generational Context

- **Concept:** Artificial Intelligence is defined as the ability of a machine to "think like a machine" or imitate the working of the human brain,.
- **Computer Generation:** AI is the defining characteristic of the **Fifth Generation** of computers. These computers utilize ULSI (Ultra Large Scale Integration) technology,.
- **KIPS:** Fifth Generation computers are also known as **KIPS** (Knowledge Information Processing System).

2. History and Key Figures

- **Father of AI: John McCarthy** is recognized as the Father of Artificial Intelligence.
- **First Chatbot: ELIZA** is considered the first chatbot in the history of computer science.
- **First Humanoid Robot: Sophia** is considered the world's first AI humanoid robot.
- **First AI Programming Language:** The first programming language developed specifically for AI was **LISP** (List Processing),.

3. Core Technologies and Concepts

The sources distinguish between three related concepts in the field of intelligent computing:

1. **Artificial Intelligence (AI):** The broader concept of machines thinking like humans.
2. **Machine Learning (ML):** The technology behind tools like ChatGPT. It involves "training machines to work".
3. **Deep Learning:** An advanced form of AI that involves robotics and neural networks.

Additionally, **Quantum Computing** is noted as the smallest and fastest type of computing that imitates brain function.

4. Programming Languages in AI

Certain programming languages are preferred for AI development, while others are generally avoided.

- **Primary Languages:**
 - **Python:** This is a primary language for AI and was specifically used to implement ChatGPT,,.
 - **C++:** Written by Bjarne Stroustrup, this language is used in many Microsoft AI tools,.
 - **LISP:** The historical foundation of AI coding.
 - **Others:** Java and JavaScript are also generally used in AI development,.
- **Excluded Languages:** **Perl** is explicitly noted as a language *not* generally used in AI,,.

5. Major AI Tools and Systems

The sources provide specific details on several prominent AI systems:

A. ChatGPT

- **Developer:** Developed by **OpenAI**.
- **Website:** The official website is `chat.openai.com` OR `www.openai.com`,.
- **Purpose:** Its main purpose is to answer questions in a "human-like way".
- **Underlying Tech:** It is based on **Machine Learning** technology.
- **Acronym:** GPT stands for **Generative Pre-trained Transformer**.

B. Other AI Assistants

- **Apple:** Apple's AI assistant is called **Siri**.
- **DeepSeek AI:** This AI tool was developed by **China**.

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C. AI Supercomputers

- **AIRAWAT:** This is an AI supercomputer developed by **C-DAC** (Centre for Development of Advanced Computing). As of 2025, it is the fastest supercomputer in **India** and ranks 75th globally.

11. Modern Applications & Indian Initiatives

I. Indian Initiatives in Technology

India has made significant strides in developing indigenous software, hardware, and digital infrastructure to ensure data sovereignty and technological self-reliance.

1. Supercomputing and Hardware

- **AIRAWAT:** As of 2025, **AIRAWAT** is the fastest supercomputer in India. It is an AI-based supercomputer developed by **C-DAC** (Centre for Development of Advanced Computing). Globally, it holds the 75th rank,.
- **SAGA-220:** A notable early supercomputer developed by the Indian Space Research Organisation (**ISRO**).
- **PARAM Series:** The **Param Padma** is noted as India's first supercomputer. Later iterations, such as **Param 1000**, are classified under Fifth Generation computers.

2. Indigenous Mobile & Web Applications

- **Sanchar Saathi Portal:** Launched in May 2023 by the **Ministry of Communications** (specifically the Department of Telecommunications or DoT), this initiative focuses on mobile theft prevention and fraud control.
 - **Key Feature:** It utilizes the **CEIR** (Central Equipment Identity Register) to block stolen mobile phones,.
 - **Objective:** To reduce telecom-related fraud and help users locate lost smartphones or manage SIM cards issued in their name,.
- **Social Media Alternatives:**
 - **Koo:** Recognized as the Indian alternative to Twitter (now X).
 - **Arattai:** An instant messaging application developed by the Indian company **Zoho**, serving as an alternative to WhatsApp,.
- **Browsers and Search Engines:**
 - **Qmamu:** The first private search engine developed in India (2021), focusing on user anonymity.
 - **Epic:** An Indian proprietary web browser known for privacy features.

3. Infrastructure and Pioneers

- **Internet Service Providers (ISP):** The first ISP in India was **VSNL** (Videsh Sanchar Nigam Limited).
- **Email Innovation:** **V.A. Shiva Ayyadurai**, an Indian-American scientist, developed an inter-office mail system in 1978 at the age of 14 and holds the copyright for the term "EMAIL".

II. Modern Applications & Technologies

The current landscape of computer science is defined by the Fifth Generation of computers, characterized by Artificial Intelligence (AI), Ultra Large Scale Integration (ULSI), and global connectivity.

1. Artificial Intelligence (AI) and Machine Learning

- **Core Concepts:** AI refers to machines "thinking" like humans, while **Machine Learning** (the technology behind ChatGPT) involves training machines to work.
- **ChatGPT:** Developed by **OpenAI**, this tool is based on Machine Learning and implemented using the **Python** programming language. Its official website is *chat.openai.com*.
- **Global AI Developments:**
 - **DeepSeek AI:** An AI developed by China.
 - **Siri:** Apple's AI assistant.
 - **Sophia:** Recognized as the world's first AI humanoid robot.
 - **ELIZA:** Considered the first chatbot in computer history.
- **Hardware:** AI and high-performance tasks often utilize **GPUs** (Graphics Processing Units), which excel at parallel processing.

2. Cloud Computing

- **Definition:** Cloud computing involves storing and accessing data online via the internet rather than on a local hard drive. The "Father of Cloud Computing" is **J.C.R. Licklider**.
- **Microsoft 365 (Office 365):** A prominent example of a subscription-based cloud service (SaaS) launched in 2011.
 - **Storage:** Files are stored by default in **OneDrive** (offering 5GB free space).
 - **Social Networking:** The suite includes **Yammer** for organizational networking.
 - **Architecture:** Much of Microsoft 365 is written in **C++**.

3. Internet of Things (IoT)

- **Concept:** IoT is an umbrella term for connecting physical objects (like home appliances and smartwatches) to the internet. The term was coined by **Kevin Ashton** in 1999.
- **Protocols:** IoT devices often use lightweight protocols like **MQTT** (Message Queuing Telemetry Transport).

4. Web 3.0 and Blockchain

- **Web 3.0:** Represents a decentralized form of the internet where users retain control over their data.
- **Blockchain:** The baseline technology for cryptocurrency transactions, ensuring decentralized and secure records. The process of creating new Bitcoin is called **Mining**.

5. Cybersecurity Threats and Tools

- **Ransomware:** A modern threat where attackers encrypt files and demand payment (often in Bitcoin).
 - **Examples:** **WannaCry**, **Petya**, **Locky**, **Bad Rabbit**, and the **AIDS Trojan** (the first ransomware, created by Joseph Popp in 1989),,,,
- **Specialized Malware:**
 - **SOVA:** A banking Trojan specifically targeting Android devices.

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- **Tyupkin:** Malware used to manipulate ATM machines.
- **Cryptojacking:** Malware designed to steal cryptocurrency from a user's wallet.
- **Dark Web:** Accessed via specialized tools like the **Tor Browser** (The Onion Router), which uses **DuckDuckGo** as its default search engine to ensure privacy,.,
- **VPN (Virtual Private Network):** Uses protocols like **PPTP** to create a secure tunnel, masking the user's IP address and encrypting data,,.,

6. Modern Global Supercomputing

- **El Capitan:** As of the 2025 Top 500 ranking, this USA-developed system is the world's fastest supercomputer, achieving performance of approximately **1.8 Exaflops**.
- **Frontier:** Another major supercomputer previously listed as the fastest in the world.

7. Digital Finance & Services

- **NFC (Near Field Communication):** A tool allowing contactless payments using smartphones.
- **Groww:** A digital tool highlighted for Mutual Fund investments.

12. Important Questions and Answers

1. Who is the father or founder of Cloud Computing?

- Answer: J.C.R. Licklider.
- Explanation: Cloud computing is storing data online via the internet.

2. Where are Microsoft 365 files stored by default?

- Answer: OneDrive.
- Note: Since this is an online version, files are stored in OneDrive.

3. Microsoft 365 offers how much free space for OneDrive?

- Answer: 5 GB.
- Note: Additional space requires a subscription.

4. Microsoft 365 is written in which programming language?

- Answer: C++.
- Note: Written by Bjarne Stroustrup, C++ is used in most Microsoft applications and AI tools.

5. What is the most widely used Dark Web Browser?

- Answer: Tor (The Onion Router).
- Note: It is free, open-source, and available for Windows, Mac, and Linux. The associated search engine is DuckDuckGo.

6. What is the result of the binary subtraction of 100101 and 011110?

- Answer: 000111 (which equals 7 in decimal),.
- Explanation: The speaker converts the first binary number to decimal (37) and the second to decimal (30). 37 minus 30 equals 7. The binary for 7 is 111,.

7. Which register is used to keep track of the next instruction to be executed?

- Answer: Program Counter (PC).

8. When a key is pressed on a keyboard, which standard is used to convert the keystroke into corresponding bits?

- Answer: ANSI (American National Standards Institute).
- Note: If "Standard" is not mentioned in the question, the answer is ASCII.

9. Which of the following translates and executes a program at run time line by line?

- Answer: Interpreter.

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- Note: If it translates "all at once," it is a Compiler.

10. Which class of IP address is reserved for Unicast?

- Answer: Class A, B, and C.

- Note: Class D is for Multicasting; Class E is for Broadcasting/Research.

11. Which shortcut key is used in MS PowerPoint 2021/2024 to insert a new slide?

- Answer: Ctrl + M.

- Note: Ctrl + N is used to create a new presentation/file.

12. Which memory is very close to the CPU?

- Answer: Cache Memory.

- Note: If "inside the CPU" is asked, the answer is Register. If Cache is not an option, the answer is RAM.

13. CPU processing power is measured in?

- Answer: MIPS (Millions of Instructions Per Second).

14. What is the default font used in MS Word 2021?

- Answer: Calibri.

- Note: The new default for 2024/later versions is Aptos.

15. The IP address 129.x.x.x belongs to which class?

- Answer: Class B.

- Note: Class B ranges from 128 to 191.

16. Which type of ROM has its capacity programmed by the Integrated Circuit manufacturer?

- Answer: Mask ROM (MROM),.

- Note: Changes can only be made during manufacturing.

17. Which programming language was used to implement ChatGPT?

- Answer: Python.

18. Which view is used to see all slides at once in MS PowerPoint?

- Answer: Slide Sorter.

19. Which ports are also known as COM ports?

- Answer: Serial Ports.

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- Note: Parallel ports are known as Centronics ports.
20. A 3.5-inch Floppy Disk by IBM could store how much data?
- Answer: 1.44 MB,.
21. What is a Proxy Server also known as?
- Answer: Gateway.
22. It is a cyber crime where the attacker floods the server?
- Answer: DDoS (Distributed Denial of Service).
 - Note: This uses Botnets (Robot Networks).
23. Which protocol is better suited for configuration where emails need to be accessed only from a single device?
- Answer: POP3 (Post Office Protocol version 3).
 - Note: For multiple devices, IMAP is used.
24. What was the boot sector virus that infected the boot sector of a floppy disk?
- Answer: Brain.
 - Note: This was the first boot sector virus.
25. What is the keyboard shortcut for inserting a hyperlink on a selected object in PowerPoint?
- Answer: Ctrl + K.
26. Where do Spelling, Thesaurus, and Workbook Statistics appear in Excel/Word?
- Answer: Review Tab.
27. Which type of connector is used to connect the modem with the telephone line?
- Answer: RJ-11.
 - Note: RJ-45 is used for Ethernet/LAN cables.
28. What is the maximum font size you can apply for any character in MS Word?
- Answer: 1638.
29. Which of the following network devices is a broadcast device?
- Answer: Hub.
 - Note: It sends data to all ports regardless of the target.
30. A key to represent the relationship between tables is called?

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- Answer: Foreign Key.

31. The Ethernet Standard is for ___ and its IEEE Standard is ___?

- Answer: Local Area Network (LAN); IEEE 802.3.

32. What is the port number of HTTPS?

- Answer: 443.

- Note: In the video, the option selected was "None of these" because 443 was not listed.

33. Which protocol is mainly used by MS Outlook to receive email?

- Answer: POP3.

- Note: IMAP is also an answer if multiple devices are involved, but POP3 was selected here.

34. Which topology is commonly used in Local Area Networks with switches?

- Answer: Star Topology.

35. DeepSeek AI was developed by which country?

- Answer: China.

36. Who is considered the first chatbot in the history of computer science?

- Answer: ELIZA,.

37. Which method bypasses the CPU for certain types of data transfer?

- Answer: DMA (Direct Memory Access).

38. In MS Excel, the error message displayed on the cell is always preceded by?

- Answer: # (Hash symbol).

39. Which of the following is essential for WAN hardware?

- Answer: Router.

40. In MS Excel, which function displays row data in a column and column data in a row?

- Answer: Transpose.

41. What is the option for sending the same document or letter to different addresses?

- Answer: Mail Merge.

- Note: Found under the "Mailings" tab.

42. What is the Octal equivalent of 14 (Decimal)?

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- Answer: 16.
 - Explanation: 14 divided by 8 is 1 with a remainder of 6. The result is written as 16.
43. Which is the smallest and fastest computer imitating brain working?
- Answer: Quantum Computing.
44. How many rows does an MS Excel 2021 worksheet contain?
- Answer: 1,048,576.
45. What is the Indian WhatsApp alternative developed by Zoho?
- Answer: Arattai.
46. The act of listening to, recording, or intercepting private communication is called?
- Answer: Eavesdropping.
47. The process through which an illegitimate website pretends to be a specific legitimate website is known as?
- Answer: Spoofing.
48. Who designed the Supercomputer in 1960 at CDC?
- Answer: Seymour Cray.
 - Note: The computer was the CDC 6600.
49. Which function is used to enter the current time in a worksheet cell?
- Answer: NOW().
 - Note: NOW gives date and time. If specifically asking for date only, it is TODAY(). For just time, NOW is still used in the context of the available options.
50. Flash memory is a form of ___ memory?
- Answer: EEPROM (Electrically Erasable Programmable Read-Only Memory).
51. What is the maximum limit of available worksheet functions in MS Excel?
- Answer: 341.
52. When keys provide sound cues, they are called?
- Answer: Toggle Keys.
 - Note: Examples include Caps Lock, Num Lock, Scroll Lock.
53. This type of ROM is manufactured empty and can be programmed only once by the user?
- Answer: PROM (Programmable Read-Only Memory),.

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54. Which RAM is commonly used in Cache Memory?

- Answer: SRAM (Static RAM).

55. Who is considered the creator of the first Ransomware?

- Answer: Joseph Popp.
- Note: The virus was the AIDS Trojan (PC Cyborg).

56. What is also known as a protocol converter?

- Answer: Gateway.

57. Word document files, Excel spreadsheets, and other files may get infected by something called a ___ virus?

- Answer: Macro Virus,.

58. How many types of Change Case options are available under MS Word 365?

- Answer: 5.
- Note: Sentence case, lower case, UPPER CASE, Capitalize Each Word, and tOGGLE cASE.

59. What type of DRAM is synchronized with the system clock?

- Answer: SDRAM (Synchronous Dynamic RAM).

60. Which protocol is the foundation of the internet and most home and business networks?

- Answer: TCP/IP.

61. An attempt to gain or change an IP address or DNS is called?

- Answer: Spoofing,.

62. To connect networks of similar protocols, which of the following are used?

- Answer: Bridge.

63. Which of the following network devices has the slowest type of connection?

- Answer: Modem (Dial-up).

64. Which technology is the baseline for cryptocurrency transactions?

- Answer: Blockchain.

65. Which ROM can be erased by using UV light?

- Answer: EPROM (Erasable Programmable Read-Only Memory).

66. Which device filters traffic using MAC address?

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- Answer: Switch.

67. Which topology connects all nodes with every other node?

- Answer: Mesh Topology.

68. Which IP address represents the Loopback address?

- Answer: 127.0.0.1.

69. Which logical gate is also known as the Universal Gate?

- Answer: NAND (or NOR).

70. The Control + Enter shortcut key is used for?

- Answer: Page Break.
- Note: Line break is Shift + Enter; Paragraph break is Enter.

71. Apple AI is called?

- Answer: Siri.

72. In MS Word, Insert Footnote appears on which tab?

- Answer: References Tab.

73. One advantage of Dial-up internet access is?

- Answer: It uses existing telephone lines.

74. If you wish to extend the length of the network without having the signal degrade, you would use?

- Answer: Repeater.

75. Name the Apple Presentation Software.

- Answer: Keynote.
- Note: Apple's word processor is Pages; Apple's spreadsheet software is Numbers.

76. What was the first microcomputer?

- Answer: Altair 8800.
- Note: If "Micral" (1973) is an option, it takes priority. If not, the answer is Altair 8800 (1975).

77. Any data or instructions entered into the memory of a computer is considered as?

- Answer: Input.

78. Which computer hardware contains a laser?

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- Answer: CD Drive (also used in Laser Printers).

79. When you shut down the Windows OS, it automatically clears the content of?

- Answer: RAM (Temporary memory).

80. Which input device can sense hand-drawn marks such as small circles or rectangles on pre-printed formats?

- Answer: OMR (Optical Mark Reader).

81. If your computer is rebooting itself, then it is likely that?

- Answer: It has a virus.

82. The unit Hertz is used to measure the speed of?

- Answer: Processor (CPU).

83. What is the latest unit used to count the speed of a printer?

- Answer: PPM (Pages Per Minute).

84. Which of the following is an example of an input device?

- Answer: Webcam.

85. Computer is free from tiredness or boredom. We call it?

- Answer: Diligence.

86. Which of the following works as both an input and output device?

- Answer: Modem (Modulator-Demodulator).

87. The boot sector files of the system are stored in which computer memory?

- Answer: ROM (Read Only Memory).

88. The extra bit in the modem is used for?

- Answer: To detect errors (Parity bit).

89. IBM 360 series, Honeywell 6000, and PDP belong to which generation of computers?

- Answer: Third Generation.

90. Register in a computer is made up of?

- Answer: Flip-flops (The collection of flip-flops is a register).

91. Which bus is used to connect the monitor to the CPU?

- Answer: SCSI (Small Computer System Interface).

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92. Which card is installed in a computer so that it can be connected to a network?

- Answer: NIC (Network Interface Card).

93. Name the "Dumb Terminal" among the following?

- Answer: Keyboard and Screen (because they do not perform processing).

94. Memory expansion in Apple is called?

- Answer: Flash.

95. Which was used in ENIAC computers (First Generation)?

- Answer: Vacuum Tubes.

96. Integrated Circuits were used in which generation?

- Answer: Third Generation.

97. The system BIOS and ROM chips are called?

- Answer: Firmware.

98. Which input device would Sameer use to see his uncle while chatting?

- Answer: Webcam.

99. ROM is needed for storing an initial program called?

- Answer: Bootstrap Loader.

100. Which of the following is true about Primary Storage?

- Answer: All of these (It is part of the CPU, allows fast access, and is relatively more expensive).

101. A storage area used to store data to compensate for the difference in speed at which different units can handle is called?

- Answer: Buffer.

102. RAM speed is measured in ____ and today most RAM is called ____?

- Answer: MHz; DDR (Double Data Rate).

103. The content of EPROM is erased by using?

- Answer: UV (Ultra-Violet) rays.

104. Which memory acts as a buffer between the CPU and Main Memory?

- Answer: Cache Memory.

105. Which computer memory chip allows simultaneous read and write operations?

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- Answer: RAM (Random Access Memory).

106. A ____ is the smallest unit that can be accessed on a storage device like a hard disk.

- Answer: Sector.

107. Hard disk is coated on both sides with?

- Answer: Magnetic Metallic Oxide.

108. Which type of RAM is normally the fastest?

- Answer: SRAM (Static RAM—used for Cache).

109. Which tool helps better for "What-if Analysis" in MS Excel?

- Answer: Goal Seek.

110. It is a free, open-source software widely used to create presentations.

- Answer: Impress (LibreOffice).

111. A ____ is software you can use on a trial basis before buying.

- Answer: Shareware (or Trialware).

112. ____ are software programs that add functionality to your computer or help it perform better.

- Answer: Utility Software (e.g., Antivirus, Disk Cleanup).

113. Which of the following file formats is supported in Windows 10 or 11?

- Answer: NTFS (New Technology File System).

114. Apple spreadsheet software is called?

- Answer: Numbers.

115. Linux is which kind of Operating System?

- Answer: All of these (Multi-user, Multi-processing, Multi-tasking).

116. It is the official App Store for Android smartphones and tablets.

- Answer: Play Store.

117. What is the launch year of Windows 11?

- Answer: 2021 (October).

118. Google Forms is which type of software?

- Answer: Survey Software.

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119. Mobile Operating Systems come under which category?

- Answer: Embedded Software.

120. Microsoft 365 is which type of service?

- Answer: Subscription Service.

121. The MS Office 365 suite is a ____ version of Microsoft Office software.

- Answer: Online / Subscription-based.

122. Which of the following is an example of Utility software?

- Answer: Antivirus (Note: Not OS, Compiler, or Drivers).

123. Which shortcut key is used to increase font size in PowerPoint?

- Answer: Ctrl + Shift + >.

124. The options to protect the Excel Sheet and Workbook are grouped under which tab?

- Answer: Review Tab.

125. What is the shortcut key to start the PowerPoint presentation from the current slide?

- Answer: Shift + F5.

126. Thesaurus tool in MS Word is used for?

- Answer: Synonyms and Antonyms (Shortcut: Shift + F7).

127. How many presentation views are there in MS PowerPoint?

- Answer: 5 (Total views are 8; Master views are 3).

128. Cell address \$A4 in a formula in MS Excel means?

- Answer: Mixed Cell Reference.

129. How can you make the selected character Superscript?

- Answer: Ctrl + Shift + +.

130. In an MS Excel formula, which symbol specifies the fixed column or row?

- Answer: Dollar (\$).

131. How many types of font styles are there in MS Excel 2021?

- Answer: 4 (Bold, Italic, Regular, Bold Italic). Default is Regular.

132. What is the shortcut key for Center Alignment in MS Office?

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- Answer: Ctrl + E.

133. All formulas in MS Excel start with?

- Answer: = (Equals to).

134. Which of the following is an example of Absolute Cell Reference?

- Answer: \$A\$9.

135. What is the shortcut for Find and Replace dialog box?

- Answer: Ctrl + H.

136. Which keyboard shortcut is used to enter a new line in Excel (in the same cell)?

- Answer: Alt + Enter.

137. What is the function of Ctrl + 0 in Excel?

- Answer: Hide the selected column (Ctrl + 9 is for rows).

138. Which shortcut key is used in MS PowerPoint for Presenter View?

- Answer: Alt + F5.

139. What is the default file name of MS Excel 2021?

- Answer: Book1.

140. Which function key repeats the last command or action?

- Answer: F4.

141. The space left between the margin and the start of a paragraph is called?

- Answer: Indentation.

142. By default, your document prints in ____ mode.

- Answer: Portrait.

143. You can use the ____ view to make global changes to your presentation.

- Answer: Slide Master.

144. First graphical browser was?

- Answer: Mosaic.

145. Web pages are saved in which of the following formats?

- Answer: HTML.

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146. HTTP is followed by ____ and ____ by default.

- Answer: Colon and two forward slashes (://).

147. What is the term for malware designed to steal cryptocurrency from a user's wallet?

- Answer: Cryptojacking.

148. A way of storing your favorite site on the Internet is known as?

- Answer: Bookmark (Shortcut: Ctrl + D).

149. ____ is the part of the World Wide Web that is not indexed by traditional search engines.

- Answer: Deep Web.

150. A ____ gives you online privacy and anonymity by creating a private network from a public internet connection.

- Answer: VPN (Virtual Private Network).

151. A ____ web page displays the same information for all users from all contexts.

- Answer: Static web page.

152. Which malware was used by hackers to manipulate ATM machines and subsequently empty them?

- Answer: Tyupkin.

153. Which shortcut key displays the Download window in Google Chrome browser?

- Answer: Ctrl + J.

154. Which function key moves the cursor to the address bar in Google Chrome?

- Answer: F6.

155. ____ is a malware that is created to generate revenue for its developer?

- Answer: Adware.

156. Sometimes your email may get stuck in the ____ of Gmail if you have an unstable internet connection.

- Answer: Outbox.

157. In computer networks, a short message that travels around the communication medium is called?

- Answer: Token (or Packet, but Token in Ring topology context).

158. Shortcut to delete browsing history in all web browsers?

- Answer: Ctrl + Shift + Delete.

159. In OSI architecture, the routing is performed by which layer?

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- Answer: Network Layer.

160. Which language is used for creating web pages?

- Answer: All of these (PHP, XML, HTML, CSS).

161. Name of the virus that fools a user into downloading it by pretending to be a useful application?

- Answer: Trojan Horse.

162. Shortcut to open a New Tab in a web browser?

- Answer: Ctrl + T.

163. Which of the following protocols is used for VPN solutions?

- Answer: PPTP (Point-to-Point Tunneling Protocol).

164. In email, which protocol allows the transfer of multimedia?

- Answer: MIME (Multimedia Internet Mail Extensions).

165. An umbrella term that refers to anything connected to the Internet.

- Answer: IoT (Internet of Things).

166. Hardware address is known as?

- Answer: MAC Address (12 characters, Hexadecimal, 48-bit).

167. IPv6 address is how many bits?

- Answer: 128 bits.

168. MAC Address is used for which purpose?

- Answer: Ether Connection.

169. Small amount of data sent over a network like LAN and Internet is known as?

- Answer: Packets.

170. Group of experts who respond to cyber security incidents?

- Answer: CERT (Computer Emergency Response Team).

171. ____ is a Russian multinational cybersecurity and antivirus provider.

- Answer: Kaspersky.

172. What special characters are NOT allowed in an email address?

- Answer: All listed (e.g., Ampersand, Equals, Apostrophe).

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173. Which Class is reserved for future use (in IP addressing)?

- Answer: Class E.

174. Which server acts as an intermediary between a workstation user and the Internet for security?

- Answer: Proxy Server.

175. ____ acts as attempting to acquire information such as usernames, passwords, and credit card details.

- Answer: Phishing.

176. The first part of a complete URL is the ____ needed to access the web resource.

- Answer: Protocol.

177. A Bridge recognizes which layer address?

- Answer: Data Link Layer (MAC Address).

178. Which shortcut key is used in Google Chrome to open the Task Manager?

- Answer: Shift + Esc.

179. Which of the following provides connectionless and unreliable service to send data?

- Answer: UDP (User Datagram Protocol).

180. ____ is a type of malware often disguised as legitimate software.

- Answer: Trojan.

181. Which protocol is used to find the IP address when the MAC address is known?

- Answer: RARP (Reverse Address Resolution Protocol).

182. Which topology requires a multi-point connection?

- Answer: Bus Topology.

183. MAC address comes under which layer in the OSI model?

- Answer: Data Link Layer

184. Which of the following is the extension name for an image file?

- Answer: .JPG (Joint Photographic Group).

185. In a database, another name for a Tuple is?

- Answer: Row.

186. 11 (Binary) + 10 (Binary) is?

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- Answer: 101.

187. Convert the Octal number 471 into equivalent Binary.

- Answer: 100111001 (4=100, 7=111, 1=001).

188. ____ is an application of computer science to provide data about biological systems.

- Answer: Bioinformatics.

189. What command is used to permanently remove a database table?

- Answer: DROP.

190. Which programming language is NOT generally used in AI?

- Answer: Perl (Python, C++, LISP are used).

191. The output quality of a printer is measured in?

- Answer: DPI (Dots Per Inch).

192. _____ monitors user activity on the internet and transmits that information in the background to someone else.

- Answer: Spyware

- Notes: The keyword "monitor" or "surveillance" implies spying, hence Spyware. Malware refers to malicious software like viruses and worms; Adware comes in the form of advertisements; Spam refers to unwanted emails; Worms replicate without human involvement, whereas viruses require human involvement.

193. Which of the following connections make use of phone lines which carry digital signals instead of analog signals?

- Answer: DSL (Digital Subscriber Line)

- Notes: When "phone lines" are mentioned, the answer is usually DSL or Dial-up. However, DSL works on digital signals, whereas Dial-up works on analog signals. DSL stands for Digital Subscriber Line.

194. Which software prevents external access to a system?

- Answer: Firewall

- Notes: A firewall is used to stop external access, preventing hackers from harming the system. A firewall is considered a combination of both hardware and software.

195. Which of the following is the default port of POP3 protocol?

- Answer: 110

- Notes: Port numbers are assigned to protocols to handle errors. Important email ports are:

- SMTP (Sending mail): Port 25.

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- POP3 (Receiving mail): Port 110.

* IMAP (Receiving mail): Port 143.

196. _____ holds the address of the active memory location.

- Answer: Memory Address Register (MAR)

• Notes: Registers are the fastest memory located inside the CPU. The sequence of memory speed is Register > Cache Memory > RAM.

197. _____ is also known as a protocol converter.

- Answer: Gateway

• Notes: A Gateway is used to connect two different networks or protocols. If the protocols are similar, a Bridge is used.

198. _____ means sending data or a file from your computer on the internet.

- Answer: Uploading

• Notes: Sending files from a computer to the internet is uploading. Saving data from a server to your computer is downloading.

199. Auxiliary memory is popularly known as _____.

- Answer: Secondary Storage

• Notes: Auxiliary memory includes CDs, DVDs, Floppy disks, Hard disks, and SSDs, which are used for backups. Primary memory refers to RAM and ROM.

200. Which of the following is the correct order of the four basic functions of a computer?

- Answer: Input, Process, Output, Storage

• Notes: This cycle is also known as IPOS.

201. In PowerPoint, two kinds of sound effect files that can be added to the presentation are _____.

- Answer: .wav and .mid files

• Notes: WAV stands for Wave files, and MID stands for MIDI files.

202. Components that provide internal storage to the CPU are _____.

- Answer: Registers

• Notes: The CPU consists of the Control Unit (CU), Arithmetic Logic Unit (ALU), and Memory Unit (Registers). Registers provide internal storage and are the fastest memory.

203. Which of the following printers uses dry ink powder?

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- Answer: Laser Printer

- Notes: Dry ink powder is also called Toner. Inkjet printers use ink cartridges. The speed of thermal, inkjet, and laser printers is measured in PPM (Pages Per Minute).

204. Who is known as the founder/inventor of the 3D printer?

- Answer: Chuck Hull

- Notes: Chuck Hull is the inventor of the 3D printer, which is useful for creating objects.

205. Indian WhatsApp alternative developed by Zoho is _____.

- Answer: Arattai

- Notes: Arattai is an instant messaging application developed by the company Zoho.

206. Your Word document files, Excel spreadsheets, and other data files may get infected by something called a _____ virus.

- Answer: Macro Virus

- Notes: Macro viruses specifically attack Microsoft Office files like Word, Excel, and PowerPoint. This is related to the "Macros" feature used for recording tasks.

207. Which of the following storage media provides sequential access only?

- Answer: Magnetic Tape

- Notes: Sequential access means retrieving data step-by-step (like old reel tapes), whereas other devices allow random access.

208. The Copy command saves the content temporarily to the _____.

- Answer: Clipboard

- Notes: Data remains in the Clipboard after cutting or copying until new content is copied.

209. Modem is a very popular computer peripheral categorized as _____ device.

- Answer: Input and Output

- Notes: A Modem (Modulator-Demodulator) converts digital signals to analog and vice versa, making it both an input and output device.

210. Which function key opens the Find and Replace box in MS Word 2021?

- Answer: F5

- Notes: The shortcut key is Ctrl + H, but the specific Function Key is F5.

211. How many types of Change Case options are available under MS Word 365?

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- Answer: 5

- Notes: The five types are Sentence case, lowercase, UPPERCASE, Capitalize Each Word, and tOGGLE cASE. The shortcut key for Change Case is Shift + F3.

212. What type of DRAM is synchronized with the system clock?

- Answer: SDRAM (Synchronous Dynamic RAM)

- Notes: RAM is broadly Static or Dynamic. SDRAM is a type of Dynamic RAM that syncs with the system clock. The system clock is maintained by the CMOS battery, which keeps the date and time updated even when the computer is off.

213. What does the NOW function return in Excel?

- Answer: Current Date and Time both

- Notes: The function returns both the current date and the time.

214. The participating computers in a network are referred to as _____.

- Answer: Nodes

- Notes: Any device participating in a network (computer, printer, fax machine) is referred to by the umbrella term "Nodes".

215. Software that is available for trial basis is called _____.

- Answer: Shareware

- Notes: Shareware is free for a trial period (e.g., WinZip) but requires payment later. Freeware is completely free (e.g., browsers); Open Source allows access to source code; Nagware annoys users with popups.

216. _____ protocol is the foundation of the internet and most home and business networks.

- Answer: TCP/IP

- Notes: TCP/IP (Transmission Control Protocol/Internet Protocol) is the basic foundation of networking. HTTP is a communication protocol, FTP is for file transfer, and Telnet is for remote access.

217. Compiler and Interpreter are which type of software?

- Answer: System Software

- Notes: They are translators categorized as System Software. Application software includes MS Word/Excel; Utility software includes antivirus and disk cleaners.

218. Which shortcut key is used to open Incognito mode in Google Chrome?

- Answer: Ctrl + Shift + N

- Notes: Incognito mode is a secret/anonymous mode where history is not recorded.

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219. When was the actual term Internet of Things (IoT) coined?

- Answer: 1999
- Notes: The term was coined by Kevin Ashton in 1999. IoT refers to connecting objects (like smartwatches, home appliances) to the internet.

220. Which protocol is used to find IP address when MAC address is known?

- Answer: RARP (Reverse Address Resolution Protocol)
- Notes: To find an IP address from a MAC address, use RARP. To find a MAC address from an IP address, use ARP (Address Resolution Protocol).

221. Some cookies are automatically recreated after a user has deleted them. These are called _____.

- Answer: Zombie Cookies
- Notes: These cookies are persistent and recreate themselves after deletion, hence the name Zombie.

222. Attempt to gain or change IP address or DNS is called _____.

- Answer: Spoofing
- Notes: Spoofing means tricking the network by changing the IP or DNS. Phishing involves stealing credentials; Vishing is voice phishing; Spooling relates to printer queues.

223. To connect a network of similar protocols, which of the following is used?

- Answer: Bridge
- Notes: A Bridge connects similar networks/protocols, while a Gateway connects different ones.

224. Which of the following network devices has the slowest type of connection?

- Answer: Dial-up
- Notes: Dial-up connections are the slowest, whereas broadband connections are fast.

225. Which generation of computers saw the widespread use of GUI?

- Answer: Fourth Generation
- Notes: GUI (Graphical User Interface) was developed at Xerox PARC by Alan Kay and became widespread in the 4th generation alongside microprocessors.

226. Topologies like Bus, Star, Ring, Tree come under which layer in the OSI model?

- Answer: Physical Layer (Layer 1)
- Notes: All network topologies fall under the first layer, the Physical Layer.

227. The Operating System used to operate the mobile phone is called _____.

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- Answer: Embedded Operating System

- Notes: While we know them as Android or iOS, the technical category for OS in mobile phones, cars, and robotics is Embedded Operating Systems.

228. _____ is a type of software program that controls a hardware device.

- Answer: Driver

- Notes: Hardware (like printers or webcams) requires drivers to function properly.

229. _____ is an extremely fast memory type that acts as a buffer between RAM and the CPU.

- Answer: Cache Memory

- Notes: Cache acts as a buffer between the CPU (Processor) and RAM.

230. Which RAM is used in computers or laptops?

- Answer: Dynamic RAM (DRAM)

- Notes: Laptops and mobiles use Dynamic RAM (specifically SDRAM), whereas Static RAM is used to create Cache memory.

231. _____ is the shortcut key for Spelling and Grammar check in MS Word.

- Answer: F7

- Notes: F7 is for Spelling and Grammar. Shift + F7 is for the Thesaurus (synonyms/antonyms).

232. _____ is a type of malware that pretends to be a useful application but actually contains malicious code.

- Answer: (Implied to be Trojan Horse based on the definition "pretends to be useful")

233. What is the function of Control + T in MS Word 365?

- o Answer: Hanging Indent.

- o Note: While Ctrl+T opens a new tab in browsers, in MS Word, it creates a Hanging Indent, which indents all lines of a paragraph except the first one.

234. What is the shortcut key for the Central Alignment of text?

- o Answer: Ctrl + E.

- o Note: Left (Ctrl+L), Right (Ctrl+R), Justify (Ctrl+J).

235. To create a Paragraph Break in MS Word 365, which key is used?

- o Answer: Enter.

- o Note: Page break is Ctrl + Enter; Line break is Shift + Enter.

236. Which line indicates a spelling error in MS Word 2021?

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o Answer: Red line.

237. What is the shortcut key for Find and Replace?

o Answer: Ctrl + H.

o Note: Ctrl + F is for Find only.

238. What is the shortcut to insert the Current Date in MS Word?

o Answer: Shift + Alt + D.

o Note: For time, it is Shift + Alt + T.

239. Where is the Footnote option found in MS Word?

o Answer: References tab.

240. What happens when pressing the F8 key three times in MS Word?

o Answer: It selects a Sentence.

241. What is the largest font size available in the MS Word dropdown list?

o Answer: 72.

o Note: Minimum is 8.

242. What is the shortcut key to open the "Save As" option?

o Answer: F12.

243. Who is the father of MS Word?

o Answer: Charles Simonyi and Richard Brodie.

244. What is the shortcut key to change the font in MS Word?

o Answer: Ctrl + Shift + F (or Ctrl + D).

245. What is the Thesaurus tool used for?

o Answer: Synonyms and Antonyms.

246. What is the shortcut to insert a Line Break?

o Answer: Shift + Enter.

247. Portrait and Landscape are options of what?

o Answer: Page Orientation.

248. What is the default margin set in MS Word 2021?

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- o Answer: 1 inch.
 - o Note: Older versions had 1.25 inches for left/right.
249. What is the shortcut key for Spelling and Grammar check?
- o Answer: F7.
250. What is the shortcut key for Thesaurus?
- o Answer: Shift + F7.
251. What is the maximum number of lines for a Drop Cap?
- o Answer: 10 lines.
 - o Note: Minimum is 1 line; default is 3 lines.
252. What is the shortcut key to remove Paragraph Formatting?
- o Answer: Ctrl + Q.
253. What is the shortcut key for Word Count?
- o Answer: Ctrl + Shift + G.
254. How many types of Views are there in MS Word 2021?
- o Answer: 5.
 - o Note: Read Mode, Print Layout, Web Layout, Outline, and Draft.
255. Which function key repeats the last command or action?
- o Answer: F4.
256. Where are the Header and Footer commands located?
- o Answer: Insert tab.
257. Where is the Zoom option placed in MS Word 2021?
- o Answer: Status Bar.
258. What is the shortcut to apply Single Spacing?
- o Answer: Ctrl + 1.
259. What is the shortcut to insert a Footnote?
- o Answer: Ctrl + Alt + F.
260. What is the shortcut to insert an Endnote?

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o Answer: Ctrl + Alt + D.

261. Which function key opens the Find and Replace box?

o Answer: F5.

262. What is the maximum limit of available worksheet functions?

o Answer: 341.

263. What is the shortcut to apply or remove Strikethrough?

o Answer: Ctrl + 5.

264. Which key is used to insert a new Worksheet?

o Answer: Shift + F11.

265. What is the font size range supported in Excel 365?

o Answer: Minimum 1, Maximum 409.

266. How many default sheets are in Excel 365?

o Answer: One (1).

267. What is the keyboard shortcut to insert a Sum Formula?

o Answer: Alt + =.

268. Which of the following is an example of Absolute Cell Reference?

o Answer: \$A\$9.

o Note: It uses dollar signs before both the column and row.

269. What is the output of the function CEILING.MATH vs FLOOR (3.7, 2)?

o Answer: Floor result is 2.

o Note: Floor looks for a value lower than 3.7 divisible by 2. Ceiling would result in 4.

270. What is A\$4 or \$A4 an example of?

o Answer: Mixed Cell Reference.

271. Where are Macros found in Excel?

o Answer: View Tab.

272. Which formula is correct to find the sum of cells A1 to A4?

o Answer: =SUM(A1:A4).

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273. By default, how are date and time aligned in a cell?

- o Answer: Right aligned (as they are numbers).
- o Note: Text is left-aligned by default.

274. Which component displays the address of the active cell?

- o Answer: Name Box.

275. Which shortcut inserts a note in a cell in Excel 365?

- o Answer: Shift + F2.
- o Note: F2 alone edits the cell.

276. What is the maximum number of sheets that can be added to a workbook?

- o Answer: 255.

277. Who invented the first electronic spreadsheet (VisiCalc)?

- o Answer: VisiCalc was the first spreadsheet.

278. What is the total number of characters a cell can contain?

- o Answer: 32,767.

279. What is the Column Width and Row Height in Excel 365?

- o Answer: Column width: 255 characters; Row height: 409 points.

280. Which function key is used to edit a cell?

- o Answer: F2.

281. What type of chart is best to display data over time?

- o Answer: Line Chart.

282. What is the default file name of MS Excel 2021?

- o Answer: Book1.

283. How many times can Undo levels be used in a worksheet?

- o Answer: 100 times.

284. What is the function of Ctrl + 0 in Excel?

- o Answer: To hide the selected column.
- o Note: Ctrl + 9 hides the row.

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285. What is the function of =NOW()?

- o Answer: Enters the current date and time.
- o Note: =TODAY() enters only the date.

286. What controls the look of your entire presentation (font, color, logo)?

- o Answer: Slide Master View.

287. What is the font size range supported in PowerPoint?

- o Answer: 1 to 3600.

288. What is the shortcut key to insert a New Slide?

- o Answer: Ctrl + M.

289. Which Apple software is used for presentations?

- o Answer: Keynote.

290. What is the shortcut for inserting a Hyperlink?

- o Answer: Ctrl + K.

291. What is the default first slide when creating a new presentation?

- o Answer: Title Slide.

292. How many presentation views are there in PowerPoint 2021?

- o Answer: 10.
- o Note: 5 in Presentation views + 3 Master views = 8, plus Presenter and Slide Show views.

293. Where is the Rehearse Timings option available?

- o Answer: Slide Show tab.

294. What is the shortcut for the Presenter View?

- o Answer: Alt + F5.

295. What are the special effects used to introduce slides called?

- o Answer: Transitions.

296. What is the maximum number of slides allowed?

- o Answer: No maximum limit.

297. What is the file extension for a PowerPoint Template?

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o Answer: .potx.

298. L2 Star 2000 and Cray X-MP belong to which generation?

o Answer: Fourth Generation.

299. IBM 360, IBM 370, and PDP belong to which generation?

o Answer: Third Generation.

300. ENIAC, UNIVAC, IBM 650 belong to which generation?

o Answer: First Generation (Vacuum Tubes).

301. IBM 1400 and CDC 3600 belong to which generation?

o Answer: Second Generation.

302. Param 1000, Intel P4, and Laptops belong to which generation?

o Answer: Fifth Generation.

303. In which generation were Integrated Circuits (IC) used?

o Answer: Third Generation.

304. What was the first Supercomputer of the world?

o Answer: CDC 6600.

305. Batch Processing was mainly used in which generation?

o Answer: First Generation.

306. Who is the concept of EBCDIC invented by?

o Answer: IBM (Mainly used in Mainframes).

307. What is the fastest Supercomputer in the world?

o Answer: Frontier.

308. What was the first computer made available for commercial use?

o Answer: UNIVAC.

309. What is a computer virus that attacks antivirus programs called?

o Answer: Retro Virus.

310. What was the first Ransomware in history (1989)?

o Answer: AIDS Trojan (PC Cyborg).

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311. Who is known as the founder of Ransomware?

- o Answer: Joseph Popp.

312. What is the Android banking Trojan malware called?

- o Answer: SOVA.

313. IP Addressing: 32-bit vs 128-bit?

- o Answer: IPv4 is 32-bit; IPv6 is 128-bit.

314. What type of data does MIME allow via SMTP?

- o Answer: Non-ASCII data (attachments/files).

315. Where does deleted mail go in Gmail?

- o Answer: Trash (for 30 days).

316. IPv6 does NOT use which type of address?

- o Answer: Broadcast.
- o Note: It uses Unicast, Multicast, and Anycast.

317. Routers operate at which OSI layer?

- o Answer: Network Layer (Layer 3).

318. Which search engine is most famous in China?

- o Answer: Baidu.

319. Which network device is a Broadcast device?

- o Answer: Hub.

320. Locky, Bad Rabbit, TeslaCrypt are types of what?

- o Answer: Ransomware.

321. What is the default search engine in Tor Browser?

- o Answer: DuckDuckGo.

322. What does a Network Interface Card (NIC) contain?

- o Answer: MAC Address (48-bit).

323. A NIC is what type of device?

- o Answer: Both Input and Output.

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324. Which device connects systems using different protocols?

o Answer: Gateway.

325. Flooding a server with unnecessary requests is an example of?

o Answer: DDoS (Distributed Denial of Service).

326. What is the process of hiding text within an image called?

o Answer: Steganography.

327. Attempting to gain information (passwords/credit cards) is called?

o Answer: Phishing.

328. Attempting to change IP address or DNS is called?

o Answer: Spoofing.

329. What is the Class of IP Address 10.52.36.1?

o Answer: Class A.

330. Hub is a ___ device and Switch is a ___ device.

o Answer: Hub is Broadcast; Switch is Unicast.

331. What gives a hacker full control of a system and is undetected by antivirus?

o Answer: Rootkit.

332. Which protocol is used to find the MAC address?

o Answer: ARP (Address Resolution Protocol).

333. Which protocol is used for remote terminal connection?

o Answer: Telnet.

334. What monitors and filters network traffic?

o Answer: Firewall.

335. Which search engine is owned by Yahoo?

o Answer: AltaVista.

336. What is the Loopback Address?

o Answer: 127.0.0.1 (used for self-testing).

337. Which search engine is based in Berlin and plants trees?

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- o Answer: Ecosia.
- 338. What is a private network for trusted third parties called?

 - o Answer: Extranet.
- 339. TCP and UDP operate in which layer?

 - o Answer: Transport Layer.
- 340. Which layer one device enlarges the area covered by a LAN?

 - o Answer: Repeater (or Hub).
- 341. What is the use of POP protocol?

 - o Answer: Retriving/Receiving mail.
- 342. Email works on which layer of the OSI model?

 - o Answer: Application Layer.
- 343. Which malware is standalone and self-replicating?

 - o Answer: Worm.
- 344. What is the Ethernet Standard?

 - o Answer: IEEE 802.3.
 - o Note: Token Ring is IEEE 802.5.
- 345. What is the official website of ChatGPT?

 - o Answer: chat.openai.com.
- 346. Who assigns IP addresses?

 - o Answer: IANA (Internet Assigned Numbers Authority).
- 347. Which protocol finds the IP address when MAC is known?

 - o Answer: RARP (Reverse ARP).
- 348. IPv4 notation is called?

 - o Answer: Dotted Decimal.
- 349. The open-source version of Netscape is?

 - o Answer: Mozilla Firefox.
- 350. Which program is used by search engines to reach websites?

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o Answer: Spider / Web Crawler.

351. Which IP classes are used for Unicasting?

o Answer: Class A, B, and C.

o Note: Class D is Multicast; Class E is Reserved.

352. Bluetooth is an example of which network?

o Answer: Personal Area Network (PAN).

353. Port numbers for SMTP and POP3?

o Answer: SMTP: 25; POP3: 110.

354. Phishing done via telephone is called?

o Answer: Vishing (Voice Phishing).

355. What is the Indian proprietary web browser?

o Answer: Epic.

356. Radio broadcast comes under which mode?

o Answer: Simplex.

357. Multi-point topology is also called?

o Answer: Bus Topology.

358. What is the formula to find nodes in Mesh Topology?

o Answer: $n(n-1)/2$.

359. Where do blacklisted emails go?

o Answer: Spam.

360. Which technology is used to hide the IP address?

o Answer: VPN (Virtual Private Network).

361. Who is the founder of Telegram (arrested in France)?

o Answer: Pavel Durov.

362. HTTP vs HTTPS port numbers?

o Answer: HTTP: 80; HTTPS: 443.

363. Which protocol is connectionless and unreliable?

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o Answer: UDP.

364. Which protocol automates IP configuration?

o Answer: DHCP.

365. What is the Gmail attachment limit?

o Answer: 25 MB.

366. Booting loads the OS into where?

o Answer: RAM.

367. Which storage device interacts directly with the CPU?

o Answer: Primary Storage (RAM).

368. BIOS is a part of which memory?

o Answer: ROM.

369. Shortcut to Restart the computer?

o Answer: Ctrl + Alt + Delete.

370. RAM type used in almost all phones?

o Answer: DRAM (specifically LPDDR).

371. Which memory has the shortest access time?

o Answer: Cache.

372. Processor speed is measured in?

o Answer: Hertz.

373. Flash memory is made up of?

o Answer: EEPROM.

374. Windows 10 release and support end years?

o Answer: Released 2015, Ends 2025.

375. What is the most popular USB Flash Drive?

o Answer: Pen Drive.

376. What are keys like Caps Lock and Num Lock called?

o Answer: Toggle Keys.

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377. What accessibility feature helps users who cannot hold multiple keys?

- o Answer: Sticky Keys (Activated by pressing Shift 5 times).

378. Software stored in ROM is called?

- o Answer: Firmware.

379. The core of the Operating System is called?

- o Answer: Kernel.

380. Which function key accesses the Boot Menu?

- o Answer: F8.

381. What is the latest Android OS (Feb 2024)?

- o Answer: Vanilla Ice Cream (Android 15).

382. What manages the printing process?

- o Answer: Spooling.

383. Interface for uncompressed video/audio?

- o Answer: HDMI.

384. Which memory acts as a buffer between CPU and Main Memory?

- o Answer: Cache.

385. The process of dividing a disk into tracks and sectors is called?

- o Answer: Formatting.

386. Which memory is volatile?

- o Answer: RAM, Cache, Registers.

387. What is the file manager in Windows called?

- o Answer: Windows Explorer (or File Explorer); Shortcut Win + E.

388. Where does the ALU store intermediate results?

- o Answer: Accumulator.

389. What are examples of Open Source Operating Systems?

- o Answer: Android, Linux, Ubuntu.

390. What is the principle of Locality of Reference used for?

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o Answer: Cache Memory.

391. A blank disc that can be written once and read many times?

o Answer: CD-R.

392. Create a new folder shortcut?

o Answer: Ctrl + Shift + N.

393. What allows printing on both sides?

o Answer: Duplex.

394. Which application software is required to open PDF files?

o Answer: Adobe Reader.

395. How many Logic Gates are in Boolean Algebra?

o Answer: 7.

396. Example of Open Source DBMS?

o Answer: MySQL.

397. Language used to create Macros?

o Answer: Visual Basic.

398. Smallest unit that can be accessed on a Hard Disk?

o Answer: Sector.

399. Compilers and Interpreters are what type of software?

o Answer: System Software.

400. In Database Hierarchy, what comes after Byte?

o Answer: Field.

o Note: Bit -> Nibble -> Byte -> Field -> Record -> File -> Database.

401. Antivirus is an example of what software?

o Answer: Utility Software.

402. Decimal equivalent of binary 111111?

o Answer: 63.

403. A row of a relation is called?

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o Answer: Tuple.

404. How many levels of headings does HTML support?

o Answer: 6 (H1 to H6).

405. Which programming language is generally NOT used in AI?

o Answer: Perl (Python, C++, Java, Lisp are used).

406. What is the memory unit after Bit?

o Answer: Nibble.

407. Which of the following malware does not replicate or reproduce through infection in a computer?

• Answer: Trojan Horse

• Notes: Trojans do not replicate. Worms work without human involvement/interaction. A Virus stands for "Vital Information Resource Under Siege." Rootkits take over administrative rights of a computer.

408. _____ protects its users by encrypting their data and masking their IP address.

• Answer: VPN (Virtual Private Network)

• Notes: It creates a secure tunnel. The protocol used on this tunnel is PPTP (Point-to-Point Tunneling Protocol).

409. Which one of the following is usually used in the process of Wi-Fi hacking?

• Answer: Air Cracking,

• Notes: Wi-Fi stands for Wireless Fidelity (IEEE 802.11). Wi-Fi signals travel on "Air," hence hacking it is called Air Cracking.,

410. In Wi-Fi Security, which of the following protocols is more used?

• Answer: WPA2 (Wi-Fi Protected Access 2)

411. DNS converts Domain Name into _____.

• Answer: IP Address,

• Notes: DNS stands for Domain Name System.

412. Best example of Internet is:

• Answer: WAN (Wide Area Network)

• Notes: WAN is also known as the Internet.

413. Which shortcut key is used to switch between open applications?

• Answer: Alt + Tab,

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414. Among these, which is not an email protocol?

- Answer: Telnet

• Notes: There are four email protocols: IMAP, POP3, SMTP, and MIME. Telnet is used for remote login. IMAP/POP3 are for receiving, SMTP for sending, and MIME for attachments.

415. In MS Excel, you can find Gridlines under the _____ tab.

- Answer: View Tab

416. What locates any resource that is available on the Internet?

- Answer: URL (Uniform Resource Locator)

417. How many color dots make up one color pixel on a screen?

- Answer: 3 (RGB - Red, Green, Blue)
- Notes: Pixel stands for Picture Element.

418. Which of the following files cannot be attached with an email?

- Answer: .exe (Executable file),

419. _____ is a signal emitted by hardware or software when a process or an event needs immediate attention.

- Answer: Interrupt

420. Which of the following is a method of accessing fixed internet for home or office?

- Answer: DSL (Digital Subscriber Line)

421. Which is a Non-Impact Printer?

- Answer: All of these (Thermal, Inkjet, Laser)
- Notes: Non-impact printers are fast; impact printers are slow. Speed is measured in PPM (Pages Per Minute). Quality is measured in DPI (Dots Per Inch).
- Printer Types Chart Notes: Impact includes Character (Dot Matrix, Daisy Wheel) and Line (Drum, Chain, Band). Non-Impact includes Inkjet, Laser, Thermal.,

422. In MS Access, a _____ name must be unique within a database.

- Answer: Table Name,

423. A table of how many columns can you insert in a Word document in maximum?

- Answer: 63
- Notes: The number must be between 1 and 63.

424. Times New Roman, Cambria, and Arial are examples of:

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- Answer: Font Faces,

- Notes: The Font Dialog box is opened using Ctrl + D.

425. _____ appears at the bottom of the Excel window.

- Answer: Worksheet Tab,

- Notes: Cell address is in the Name Box; Cell content is in the Formula Bar.

426. To indent the first paragraph of your report, you should use this key:

- Answer: Tab Key

- Notes: The shortcut for indenting is Ctrl + M.

427. When you save an MS Access Project, what file format do you use?

- Answer: .adp

428. A _____ is a small program embedded inside of a GIF image.

- Answer: Web Bug

- Notes: GIF stands for Graphical Interchange Format.

429. What kind of programming language is Java?

- Answer: Object-Oriented Programming Language

- Notes: It is a high-level language (3rd Generation). "Object-oriented" implies reusability of modules.

430. Actual execution of instructions in a computer takes place in:

- Answer: ALU (Arithmetic Logic Unit),

- Notes: Results are stored in the Accumulator Register. The Control Unit (CU) decodes instructions.

431. The simultaneous execution of two or more instructions is called:

- Answer: Multiprocessing

432. _____ was the first web-based email service founded in 1996.

- Answer: Hotmail,

- Notes: Founded by Sabeer Bhatia. Later renamed Outlook. The concept of email was started by Ray Tomlinson in 1971.

433. _____ is an application of computer science to provide data about biological systems.

- Answer: Bioinformatics,

434. Bluetooth is the wireless technology for:

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- Answer: PAN (Personal Area Network)

435. Which layer is responsible to detect and correct errors in the OSI Model?

- Answer: Data Link Layer
- Notes: Works on MAC Address (48-bit). Devices: Switch, Bridge, Modem.,

436. What will be the result of the MS Excel formula: ODD(20) + EVEN(39)?

- Answer: 61
- Notes: ODD(20) converts to the next odd number (21). EVEN(39) converts to the next even number (40). $21 + 40 = 61$.

437. A Bridge recognizes _____ layer address.

- Answer: Data Link Layer (Layer 2),

438. Which shortcut key is used in Google Chrome to open Downloads?

- Answer: Ctrl + J

439. The System BIOS and ROM chips are called:

- Answer: Firmware
- Notes: Instructions that cannot be modified.

440. Name the first Graphical Web Browser.

- Answer: Mosaic,
- Notes: The very first browser was WorldWideWeb (without spaces).

441. What is the maximum font size you can apply for any character in MS Word 2021?

- Answer: 1638
- Notes: Minimum is 1. Dropdown list range is 8 to 72.

442. This is a network layer protocol used by network devices to diagnose network communication issues.

- Answer: ICMP (Internet Control Message Protocol)

443. Which of the following protocols provides a logical address from a physical address?

- Answer: RARP (Reverse Address Resolution Protocol)
- Notes: Logical address = IP; Physical address = MAC. ARP finds MAC from IP. RARP finds IP from MAC.,

444. The IPv4 has a _____ notation for address.

- Answer: Dotted Decimal

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445. Identify the protocol primarily used to connect to the Internet.

- Answer: TCP/IP

446. Which of the following wireless technologies provides Mesh Network Architecture in the easiest way?

- Answer: Zigbee,
- Notes: Zigbee is low power and battery-saving.

447. The number of bits used to store BCD digit is:

- Answer: 4 bits

448. Which protocol is a lightweight protocol?

- Answer: MQTT (Message Queuing Telemetry Transport)
- Notes: Used in IoT (Internet of Things).

449. Which type of graphics represents images as compiled using pixels or dots?

- Answer: Raster Images (or Bitmap Graphics),
- Notes: These blur when zoomed. Examples: BMP, TIFF, GIF, JPG.

450. Which type of graphics represents images as a set of basic drawing shapes like lines, circles, curves?

- Answer: Vector Images
- Notes: Based on mathematical formulas. Best for logos.

451. The basic logic gate whose output is the complement of the input is:

- Answer: NOT Gate (Inverter)

452. IPv6 was developed by:

- Answer: IETF (Internet Engineering Task Force)
- Notes: IPv6 is 128-bit hexadecimal.

453. Who developed the basic architecture of the computer?

- Answer: John von Neumann,

454. IEEE Standard for Bluetooth:

- Answer: 802.15.1
- Notes: 802.3 is Ethernet. 802.11 is Wi-Fi. 802.4 is Token Bus. 802.5 is Token Ring.

455. Printer uses which port?

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- Answer: Parallel Port

- Notes: Mouse/Keyboard historically used Serial Ports.

456. What is the main purpose of ChatGPT?

- Answer: To provide answers to questions in a human-like way,

- Notes: Developed by Open AI.

457. _____ is a US-based online service provider and ISP along with a search engine.

- Answer: AOL (America Online)

458. LAN has mostly used the _____ topology.

- Answer: All of these (Bus, Star, Ring)

459. Which topology requires the most amount of wiring?

- Answer: Mesh Topology

- Notes: Formula for links: $n(n-1)/2$.

460. In networking, port numbers of IMAP and POP3 are:

- Answer: IMAP: 143, POP3: 110

461. Which Windows 11 feature helps end users to arrange applications in six different layouts?

- Answer: Snap Layout

462. Name the first ISP of India.

- Answer: VSNL (Videsh Sanchar Nigam Limited)

- Notes: The first ISP in the world was Telenet.

463. File extension on MS Paint is:

- Answer: .bmp (Bitmap Image)

464. In which text are Email messages usually encoded?

- Answer: ASCII (American Standard Code for Information Interchange)

465. Which function key moves the cursor to the address bar in Google Chrome?

- Answer: F6

466. Which one of the following network devices is the broadcast device?

- Answer: Hub

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467. What computers were the SCSI port used for?

- Answer: Small Computer System Interface (SCSI)

468. Using the cell address \$A4 within a formula in Excel means it is a:

- Answer: Mixed Cell Reference,
- Notes: \$A\$4 is Absolute. A4 is Relative.

469. What is the maximum length of SSID?

- Answer: 32 Characters
- Notes: SSID = Service Set Identifier (Wi-Fi Name).

470. Which memory device is generally made up of semiconductors?

- Answer: RAM

471. In Windows 11, minimum processor requirement is:

- Answer: 1 GHz
- Notes: RAM requirement is 4GB.

472. USB 1.0 and USB 2.0 use _____ mode of communication.

- Answer: Half Duplex
- Notes: USB 3.0 uses Full Duplex.

473. Key to represent relationship between tables is called:

- Answer: Foreign Key,

474. Which function key opens Find and Replace box in MS Word 2021?

- Answer: F5
- Notes: Shortcut is Ctrl + H.

475. The central organization responsible for creating and maintaining web standards is:

- Answer: W3C (World Wide Web Consortium)

476. Print Quality of printer is given in _____ and speed is given in _____.

- Answer: DPI (Dots Per Inch) ; PPM (Pages Per Minute)

477. Which shortcut key is used in MS Word 2021 to display the Word Count Dialog box?

- Answer: Ctrl + Shift + G,

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478. What is the maximum number of primary partitions that can be created on a hard disk?

- Answer: 4

479. _____ is a decentralized form of the Internet where people enjoy control over their data.

- Answer: Web 3.0

480. Your Word, Excel, and other data files may get infected by something called:

- Answer: Macro Virus

481. Alt + F5 in MS PowerPoint is used for which purpose?

- Answer: Presenter View
- Notes: Shift + F5 starts show from current slide. F5 starts from beginning.

482. _____ is a private network that enterprises use to provide trusted third party access.

- Answer: Extranet
- Notes: Network for employees only is Intranet.

483. Which of the following is not allowed in Email ID?

- Answer: Blank Space

484. Which Secondary Storage device uses NAND based flash memory technology?

- Answer: SSD (Solid State Drive),

485. Which component of CPU allows for parallel processing and improved multitasking?

- Answer: Cores

486. In which type of task do GPUs typically excel?

- Answer: Parallel Processing

487. Which programming languages are considered High Level Languages?

- Answer: Python, Java, C++

488. Which Windows version introduced the Start Menu and Taskbar?

- Answer: Windows 95

489. Which Windows version introduced the concept of Windows as a Service?

- Answer: Windows 10,

490. _____ is the process of monitoring and capturing all the packets passing through a given network.

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- Answer: Sniffing

491. Which function will be used to enter current time in a worksheet cell?

- Answer: NOW()
- Notes: TODAY() is for Date. NOW() is for Date and Time.

492. Which of the following computer hardware contains a laser?

- Answer: CD Drive (Optical Disk)

493. A way of storing your favorite site on the Internet is known as:

- Answer: Bookmark
- Notes: Shortcut is Ctrl + D. Hyperlink is Ctrl + K.

494. Ethernet Standard is for _____ and its IEEE standard is _____.

- Answer: LAN (Local Area Network); 802.3

495. Among these which is not a Fiber Optic Connector?

- Answer: RJ-45
- Notes: RJ-45 is used in Ethernet/Twisted Pair cables. SC, ST, LC, FC are fiber optic connectors.

496. Insert Caption, Cross Reference, Citation and Bibliography options are visible under which tab in MS Word 2021?

- Answer: References Tab,

497. Which of the following holds the processed result that are awaiting output?

- Answer: Main Memory (RAM)

498. In Windows 11, which character is not allowed as file name?

- Answer: ? (Question Mark)
- Notes: Also not allowed: \ / : * " < > |.

499. The process of converting from a digital format to analog format is called:

- Answer: Modulation
- Notes: Analog to Digital is Demodulation.

500. Which shortcut is used to open a new tab in a web browser?

- Answer: Ctrl + T
- Notes: Ctrl + W closes a tab.

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501. _____ protocol allows you to transfer the files and also adds a layer of security to the process.

- Answer: SFTP (Secure File Transfer Protocol)

502. Cookies are tiny text files stored on:

- Answer: Client (Browser),
- Notes: They are sent by the Server.

503. The Buffer memory is mainly located in _____ of computer.

- Answer: RAM
- Notes: Virtual memory uses space from the Hard Disk.

504. _____ was a Trojan released in 2000 which was used in the world's most damaging cyber attack.

- Answer: I LOVE YOU

505. Which numbers are used extensively in microprocessor work?

- Answer: Hexadecimal

506. Which one of the following network devices store the MAC Address?

- Answer: Switch,

507. Which is the name of the first Super Computer of the World?

- Answer: CDC 6600
- Notes: India's first was Param Padma.

508. The process of creating new Bitcoin is known as:

- Answer: Mining

509. Internet Explorer is officially retired on which date?

- Answer: 15 June 2022

510. Fifth Generation Computer is also known as:

- Answer: KIPS (Knowledge Information Processing System)
- Notes: 5th Gen includes AI and ULSI (Ultra Large Scale Integration).

511. What is the use of Shift + F3 shortcut in MS Excel 2021?

- Answer: To insert a function

512. What is the output of the MS Excel Function: FLOOR(34, 5)?

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- Answer: 30

- Notes: Finds the multiple of 5 closest to 34 (rounding down). CEILING would give 35.

513. Which software has exclusive feature Shell?

- Answer: Unix,

514. What is the maximum limit of available worksheet functions in MS Excel?

- Answer: 341

515. _____ is a software application that provides comprehensive facilities for software development.

- Answer: IDE (Integrated Development Environment)

516. This protocol allows electronic instruments and other digital musical tools to communicate with each other.

- Answer: MIDI (Musical Instrument Digital Interface)

517. To test the IP stack on your local host, which IP address would you ping?

- Answer: 127.0.0.1

- Notes: Known as Loopback Address or Localhost.

518. Speed of CPU is measured in:

- Answer: All of these (FLOPS, Hz, MIPS),

519. A computer virus that actively attacks an antivirus program:

- Answer: Retro Virus

520. In MS PowerPoint 365, which shortcut key is used to show/hide the grid?

- Answer: Shift + F9

521. Creeper program, regarded as the first virus, was created by:

- Answer: Bob Thomas

522. How many bits are there in Ethernet Address?

- Answer: 48 bits,

- Notes: Also known as MAC Address.

523. A _____ is a blank disk that can be written once.

- Answer: CD-R (Recordable)

524. Time taken to read and write the hard disk:

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- Answer: Seek Time

- Notes: The educator explains: Read/Write = Learn = Seek Time. Latency Time = Request and Response.,

525. The deleted mail in Gmail account goes in which folder?

- Answer: Trash

- Notes: Stays for 30 days.

526. Which OSI layer is closest to the end user?

- Answer: Application Layer

527. _____ is the act of attempting to acquire information such as username, password and credit card details.

- Answer: Phishing,

528. Control + Enter shortcut key is used for:

- Answer: Page Break

- Notes: Shift + Enter is for Line Break. Enter is for Paragraph Break.

529. The Copy command saves the content temporarily to the _____.

- Answer: Clipboard

530. Cache memory is made up of:

- Answer: Static RAM,

531. Question of the Day: Which of the following is a class of computer threat?

- Answer: (Viewer to answer in comments) Options include Phishing, DoS attack, Ransomware, Stalking, Trojan Horse.

532. _____ can replicate and spread without any human activation.

- Answer: Worm

- Notes: Worm: Capable of replicating and spreading automatically without human involvement. It is self-reliant.

Virus: Requires human activation (e.g., clicking a file, inserting a pen drive) to replicate and spread.

533. Flash memory can be erased _____.

- Answer: In blocks or sectors

- Notes: Flash memory (like pen drives or SSDs) allows data to be erased in entire blocks or sectors rather than one bit or byte at a time.

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534. Which among the following keyboard shortcut is used to bookmark the current web page on the web browser?

- Answer: Ctrl + D
- Notes: Ctrl + D: Bookmarks the page so you don't need to type the URL again.

Ctrl + K: Used for Hyperlink.

Ctrl + B: Bold; Ctrl + I: Italic.

Ctrl + N: Opens a new document in MS Word.

535. _____ is a special purpose register designated to hold the result of an operation performed by the ALU.

- Answer: Accumulator Register
- Notes: Registers are the fastest memory located inside the CPU.

The Accumulator stores the results of arithmetic operations (e.g., $1 + 2 = 3$; the "3" is stored here).

The Memory Unit (MU) in a CPU is also referred to as a Register.

536. The first computer which provided storage is:

- Answer: EDSAC
- Notes: EDSAC: Electronic Delay Storage Automatic Calculator.

The concept of storage in computers was introduced by John von Neumann.

537. By default, Date and Time are _____ in a cell of an MS Excel sheet.

- Answer: Right Aligned
- Notes: In Excel, dates and times are treated as numbers, which are right-aligned by default.

Text is left-aligned by default.

538. In MS PowerPoint 365, which shortcut key is used to show or hide the grid?

- Answer: Shift + F9
- Notes: A grid is the structure where rows and columns meet.

539. Who is responsible for assigning IP addresses?

- Answer: IANA (Internet Assigned Numbers Authority)
- Notes: IANA: Assigns IP addresses.

Router: The device responsible for governing IP addresses at the Network layer.

NIC (Network Interface Card): Contains the MAC address.

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W3C: World Wide Web Consortium (standardizes the web).

540. IPv6 was developed by _____ to deal with the problem of IPv4 exhaustion.

- Answer: IETF (Internet Engineering Task Force)
- Notes: IPv6 was created because IPv4 addresses were running out (exhaustion). It ensures every device can have a separate IP address.

541. The PDU (Protocol Data Unit) of the Transport Layer is referred to as _____ in the OSI Model.

- Answer: Segment
- Notes: Physical Layer: Bits.

Data Link Layer: Frames.

Network Layer: Packets.

Transport Layer: Segment.

Session/Presentation/Application Layers: Data.

542. Which topology requires a multipoint connection?

- Answer: Bus Topology
- Notes: A single cable connects multiple nodes/computers, which is why it is called a multipoint connection.

543. Microsoft 365 is written in which programming language?

- Answer: C++
- Notes: Microsoft 365 is a subscription-based online platform for MS Office.

544. _____ is an Office 365 social networking app for organizations where employees can connect with all their coworkers.

- Answer: Yammer
- Notes: Yammer is recognized as the social networking application within the Office 365 suite.

545. Name the first private search engine developed in India in 2021.

- Answer: Qmamu
- Notes: It is an anonymous/private search engine developed in India.

546. _____ is a private network that enterprises use to provide trusted third parties.

- Answer: Extranet
- Notes:

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- o Extranet: Accessed by third parties like shareholders, partners, or debenture holders.
- o Intranet: Accessed only by employees within an organization.
- o Internet: Public World Wide Web.
- o VPN: Virtual Private Network (secure tunnel).

547. Which of the following was the first commercial web browser?

- Answer: Netscape (or Netscape Navigator)
- Notes:
- o First Commercial Browser: Netscape.
- o First Web Browser: WorldWideWeb (later renamed Nexus).
- o First GUI Browser: Mosaic.

548. Which among the following is used to identify a user who returns to a website?

- Answer: Cookies
- Notes:
- o Cookies track user activity (clicks, shopping, return visits).
- o They are sent by the Server and stored on the Client (Browser).

549. _____ is a search engine created by Gabriel Weinberg in 2008. This search engine is dedicated to the online privacy of its users.

- Answer: DuckDuckGo
- Notes:
- o DuckDuckGo: A private search engine created in 2008.
- o Tor Browser: Often used with DuckDuckGo for maximum privacy (Dark Web access).

550. What is the limit of number of emails that can be sent through a free Gmail account per day using a web browser?

- Answer: 500 emails
- Notes: The limit is 500 emails within a 24-hour period for a free account.

551. _____ is considered the first internet search engine.

- Answer: Archie

552. WannaCry, Petya, CryptoLocker, Bad Rabbit are types of:

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- Answer: Ransomware
- Notes:
 - o Function: Ransomware encrypts (locks) files and folders.
 - o Demand: Hackers demand payment (often in Bitcoin) to decrypt/unlock the data.
 - o Targets: Often targets governments, companies, and institutions with valuable data.

553. _____ was the first antivirus software designed to delete Creeper by moving across the ARPANET.

- Answer: Reaper
- Notes: Reaper was the first antivirus created to kill the Creeper virus.

554. Which shortcut key is used in MS PowerPoint 2021/2024 to insert a new slide?

- Answer: Ctrl + M
- Notes:
 - o Ctrl + M: Insert New Slide.
 - o Ctrl + N: Open New Presentation File.

555. _____ is a search engine based in Berlin, Germany.

- Answer: Ecosia
- Notes:
 - o Ecosia: Berlin/Germany.
 - o Bing, DuckDuckGo, WolframAlpha, Google: USA.
 - o Qmamu: India.
 - o Naver: South Korea.
 - o Yandex: Russia.

556. Which function keys display the Print Preview window in MS Office?

- Answer: Ctrl + F2
- Notes:
 - o Ctrl + F2: Print Preview.
 - o F2: Rename a file or folder.

557. Which memory is very close to the CPU?

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- Answer: Cache Memory
- Notes:
 - o Registers: Located inside the CPU.
 - o Cache: The closest memory outside the CPU.
 - o Primary Memory (RAM): The next answer if Cache is not an option.

558. Which among these is NOT an open source Operating System?

- Answer: Unix
- Notes:
 - o Open Source (Free/Modifiable): Linux, Ubuntu, Android, OpenBSD.
 - o Not Open Source: Unix.

559. Users write the program in which language?

- Answer: High Level Language
- Notes:
 - o Programmers write in High Level Languages (like C, C++, Java) which use English formats.
 - o Translators (Compilers/Interpreters/Assemblers) convert this to Machine Language for the computer to understand.

560. A digital image is made up of thousands of _____.

- Answer: Pixels
- Notes: Pixel stands for Picture Element.

561. Which file format is excellent for animation purposes?

- Answer: GIF
- Notes:
 - o GIF: Graphics Interchange Format.
 - o It supports moving images (animations).

562. Which of the following is the fastest means of memory access for CPU?

- Answer: Register
- Notes:
 - o Fastest: Register (inside CPU).

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- o Second: Cache.
- o Third: RAM (Static RAM is faster than Dynamic RAM).

563. In the CPU of a computer, _____ delivers power supply to all the components at appropriate voltage.

- Answer: SMPS (Switch Mode Power Supply)
- Notes: It includes the fan seen at the back of the CPU case and connects to the power plug.

564. CPU processing power is measured in:

- Answer: MIPS (Millions of Instructions Per Second)
- Notes:
 - o Primary measure: Hertz (Hz).
 - o If Hz is not an option: MIPS.
 - o If MIPS is not an option: KIPS (Kilo/Thousand Instructions Per Second).

565. For a Drop Cap, the maximum number of lines is:

- Answer: 10 Lines
- Notes:
 - o Drop Cap: Makes the initial letter large (like a newspaper).
 - o Maximum: 10 lines.
 - o Default: 3 lines.
 - o Minimum: 1 line.

566. What is the default font used in MS Word 2021 document?

- Answer: Calibri
- Notes:
 - o MS Word 2021: Calibri.
 - o MS Word 2024: The new default font is Aptos (changed after 17 years).

567. Which social media site is the best for professional networking?

- Answer: LinkedIn
- Notes: Connects job seekers and job givers. Owned by Microsoft.

568. Which of the following memories must be refreshed many times per second?

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- Answer: Dynamic RAM (DRAM)
- Notes:
 - o DRAM: Must be refreshed constantly. Used in computers/mobiles.
 - o SRAM (Static RAM): Does not need refreshing; faster; used for Cache.
 - o SDRAM: Synchronizes with computer speed/clock (Date/Time).

569. Browsing the internet and USB comes under which mode of networking communication?

- Answer: Half Duplex
- Notes:
 - o Simplex: TV Remote.
 - o Half Duplex: Walkie Talkie, Internet Browsing, USB.
 - o Full Duplex: Mobile phones, Video Conferencing.

570. The graphical representation of an algorithm is called:

- Answer: Flowchart
- Notes: Represents a step-by-step process using shapes (Start, End, Process).

571. IP Address 129.6.8.4 is of which class of IP address?

- Answer: Class B
- Notes: Look at the first number (129) to determine the class:
 - o Class A: 0 - 127.
 - o Class B: 128 - 191 (129 falls here).
 - o Class C: 192 - 223.
 - o Class D: 224 - 239.
 - o Class E: 240 - 255.
 - o Note: Any number above 255 is invalid.

572. Which one of the following folders is used to store deleted emails?

- Answer: Trash Folder.
- Notes: Deleted emails (whether intentional or accidental) go to the Trash folder.

Emails remain in the Trash folder for 30 days, during which they can be recovered. After 30 days, they are permanently removed.

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573. Which factor directly improves RAM performance?

- Answer: More GHz (Gigahertz).
- Notes: RAM speed is measured in Hertz (MHz or GHz).

Higher frequency (MHz/GHz) means better system performance. Modern DDR5 RAM can have speeds exceeding 6000 MHz.

574. Which ROM can be erased using UV light?

- Answer: EPROM (Erasable Programmable Read-Only Memory).
- Notes: PROM: No changes possible.

EPROM: Can be erased using Ultra-Violet (UV) light.

EEPROM: Can be erased using electric signals.

Mask ROM (MROM): Data is printed on the chip during manufacturing and cannot be changed.

575. The BIOS is stored in which computer memory?

- Answer: Flash Memory.
- Notes: BIOS (Basic Input Output System) is used during the booting process to control input/output devices.

While usually stored in ROM, Flash Memory is the advanced form of EEPROM used in modern systems. If "ROM" is not an option, "Flash Memory" is the correct answer.

576. Which factor has the most impact on Hard Disk Drive sequential performance?

- Answer: RPM (Revolutions Per Minute).
- Notes: Hard disk speed is measured in RPM. Standard speeds are typically 5400 RPM or 7200 RPM.

577. Which device filters traffic using MAC address?

- Answer: Switch.
- Notes: A Switch operates on the Data Link Layer (Layer 2) and uses MAC addresses to filter traffic.

MAC Address: Media Access Control address, 48-bit, unique, hexadecimal format.

578. Which device uses IP routing table to forward packets?

- Answer: Router.
- Notes: Routers operate on the Network Layer and deal with IP addresses and packets.

579. Which topology provides the highest fault tolerance?

- Answer: Mesh Topology.

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- Notes: It is considered the best topology regarding recovery from faults.

580. Which topology connects all nodes with every other node?

- Answer: Mesh Topology.

• Notes: Every computer is connected to every other computer. The formula to find the number of links is $\frac{n(n-1)}{2}$.

581. Which topology is most easy to add a new node?

- Answer: Star Topology.

• Notes: It uses a central device (Hub), making it easy to connect new computers.

582. Which topology has the highest installation and maintenance cost?

- Answer: Mesh Topology.

• Notes: Because it requires the most cabling (connecting every node to every other node), it is the most expensive to install and maintain.

583. Which MAC address format uses hyphen or colon for separation?

- Answer: Hexadecimal Format.

• Notes: MAC addresses are 12 digits long in hexadecimal format. The first 6 digits represent the OUI (Organizational Unique Identifier) and the last 6 represent the NIC (Network Interface Controller).

584. Which IP address represents Loopback?

- Answer: 127.0.0.1.

• Notes: Also known as "Local Host" or "Testing Address." It is used to test network cards or local applications.

585. The most open source DBMS is?

- Answer: MySQL.

• Notes: MySQL is a free, open-source Database Management System utilizing SQL (Structured Query Language).

586. What is the function of Control + T in MS Word?

- Answer: Hanging Indent.

• Notes: A hanging indent aligns all lines in a paragraph except the first line.

587. In IEEE Standard, 802.5 is called?

- Answer: Token Ring.

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- Notes: 802.3: Ethernet

802.4: Token Bus

802.11: Wireless Network (Wi-Fi)

802.5: Token Ring.

588. Layer 5 of OSI Model is?

- Answer: Session Layer.

• Notes: The OSI layers are: 1. Physical, 2. Data Link, 3. Network, 4. Transport, 5. Session, 6. Presentation, 7. Application.

589. Which logical gate is known as Universal Gate?

- Answer: NAND Gate.

• Notes: There are two universal gates: NAND and NOR.

590. ____ is a network protocol used to automate the process of configuring devices on IP network.

- Answer: DHCP (Dynamic Host Configuration Protocol).

• Notes: DHCP automatically assigns IP addresses to devices on a network.

591. Which shortcut key is used in MS Word 2021 to switch text between Upper Case, Lower Case, and Title Case?

- Answer: Shift + F3.

• Notes: This is known as the "Change Case" command.

592. The circuit used to store one bit of data is called?

- Answer: Flip Flop.

• Notes: A collection of Flip Flops is called a Register (the fastest memory in a computer).

593. SSD data transfer speed is measured in?

- Answer: Bytes per second (BPS).

• Notes: While HDD speed is in RPM, SSD (Solid State Drive) speed is measured in Bytes per second. Its capacity is measured in Gigabytes (GB) or Terabytes (TB).

594. Which programming language is NOT generally used in AI?

- Answer: Perl.

• Notes: Common AI languages include Python, C++, Java, JavaScript, Julia, and LISP (the first AI language). Perl is generally not used.

595. ____ is considered to be the world's first Artificial Intelligence humanoid robot.

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- Answer: Sophia.

596. Email works on the ____ layer of OSI model.

- Answer: Application Layer.
- Notes: This is the 7th (topmost) layer of the OSI model.

597. Which application software is required to open a PDF file?

- Answer: Adobe Reader.
- Notes: PDF stands for Portable Document Format. It ensures document formatting does not change across devices.

598. Which of the following is NOT a type of margin in MS Word document?

- Answer: Center.
- Notes: Valid margins are Top, Bottom, Left, Right, and Gutter (space left for binding). There is no "Center" margin.

599. When you create a new presentation, what will be the first slide in MS PowerPoint 2021?

- Answer: Title Slide.

600. Who invented RAM and ROM?

- Answer: Robert Heath Dennard.

601. What is the maximum number of sheets that can be added to an Excel Workbook?

- Answer: 255.
- Notes: In older versions, the default was 3 sheets; in newer versions, it is 1, but up to 255 can be added.

602. Which of the following translates and executes programs at run time line by line?

- Answer: Interpreter.
- Notes: Interpreter: Translates line by line.

Compiler: Translates all at once.

603. Match the Column (Terms vs. Functions):

- Answer:
 - o Bluetooth \rightarrow Pairing
 - o Tor Browser \rightarrow Anonymizer (Used for Dark Web/anonymous browsing).
 - o BIOS \rightarrow Power On Self Test (POST).

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o Torrent \rightarrow Peer-to-Peer (P2P).

604. The official website of ChatGPT is?

- Answer: www.openai.com.
- Notes: GPT stands for Generative Pre-trained Transformer.

605. Compiler converts source code into?

- Answer: Object Code.
- Notes: This is also referred to as machine code.

606. This allows the computer to share the same IP address.

- Answer: NAT (Network Address Translation).

607. Which program is used by search engines to reach the website?

- Answer: Spider (or Crawler).
- Notes: It crawls websites to index them for search engines.

608. When ____ keys are on, the computer provides sound cues.

- Answer: Toggle Keys.
- Notes: These include Caps Lock, Num Lock, and Scroll Lock. They are designed to help visually impaired users by producing sound when pressed.

609. Which of the following memory chip is fastest?

- Answer: SRAM (Static RAM).
- Notes: SRAM is faster than DRAM (Dynamic RAM) and is used to create Cache Memory. Registers are faster than SRAM, but if Registers are not an option, SRAM is the answer.

610. Gmail uses ____ as its default font.

- Answer: Sans Serif.

611. Which memory is an example of semiconductor memory and is volatile?

- Answer: RAM (Random Access Memory).
- Notes: Volatile means temporary memory. RAM and ROM are both semiconductor memories, but RAM is the volatile one.

612. Virtual memory is typically located on:

- Answer: On the Hard Drive.

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- Notes: Virtual memory is a concept where the system borrows space from the Hard Disk to virtually increase the size of the RAM to run heavy applications.

613. A ____ is a blank disc that can be written once and read arbitrarily many times.

- Answer: CD-R (Compact Disc Recordable).

- Notes: CD-RW stands for Re-Writable, meaning it can be written to many times, which does not fit the question.

CD-ROM is Read-Only Memory, meaning you cannot write to it, only read.

CD-R allows writing once but reading multiple times.

614. Sanchar Saathi portal is launched by which Ministry?

- Answer: Ministry of Communications.

- Notes: This portal helps locate lost or stolen smartphones. It also allows users to check how many SIM cards are issued on their ID and manage them.

615. Which government body developed the Sanchar Saathi App?

- Answer: DoT (Department of Telecommunications).

- Notes: If the question asks for the "Ministry," the answer is the Ministry of Communications; if it asks for the "Government Body" or developer, the answer is DoT.

616. What is the main objective of the Sanchar Saathi application?

- Answer: Mobile theft prevention and fraud control (To reduce telecom-related fraud).

- Notes: It helps in blocking stolen mobile phones and controlling fraud regarding SIM cards.

617. Which service of Sanchar Saathi helps to block stolen mobile phones?

- Answer: CEIR (Central Equipment Identity Register).

- Notes: This is a crucial feature used to block mobile phones via the portal.

618. Who launched the Sanchar Saathi application?

- Answer: Ashwini Vaishnaw.

- Notes: He is the Minister of Communications.

619. In which year was Sanchar Saathi launched by the government?

- Answer: 2023 (specifically May 2023).

- Notes: The government has mandated that this app be installed by default on all new smartphones in India and made it undeletable by users to ensure security.

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620. Which app is called India's alternative to Twitter?

- Answer: Koo.
- Notes: Twitter is now known as X, and Koo is considered its Indian alternative.

621. What does the term HTTP 404 error signify?

- Answer: Page not found on the server.
- Notes: This indicates a broken link where data has been removed or the page is simply unavailable on the server.

622. The basic computation unit of the CPU (Central Processing Unit) is known as:

- Answer: ALU (Arithmetic Logic Unit).
- Notes: The ALU performs mathematical (addition, subtraction) and logical operations (greater than, less than, AND, OR).

CU (Control Unit): Acts as the brain, decoding instructions and coordinating execution.

Memory Unit (Registers): The fastest memory located inside the CPU made of collections of Flip-Flops.

623. The time between program input and output is called:

- Answer: Execution Time.
- Notes: This is the time gap between providing input to the computer and receiving the output.

624. Add more ____ to your PC for better performance.

- Answer: RAM (Random Access Memory).
- Notes: Adding RAM improves the speed and performance of a personal computer.

625. Among these, which is NOT antivirus software?

- Answer: Code Red.
- Notes: Code Red was a computer worm (virus) introduced on July 15, 2001.

McAfee, BitDefender, Norton, and Malwarebytes are all examples of antivirus software.

626. In Data Link Layer, ____ device has only two ports and ____ can handle many ports.

- Answer: Bridge (has 2 ports) and Switch (has many ports).
- Notes: Both devices operate on the Data Link Layer (Layer 2 of the OSI Model), which is responsible for error-free data transfer.

627. ____ is an Indian American scientist who holds the copyright for the term "EMAIL" and developed an inter-office mail system in 1978 at the age of 14.

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- Answer: V.A. Shiva Ayyadurai.

- Notes: While Ray Tomlinson is globally recognized as the founder of email, Shiva Ayyadurai is the Indian-American scientist associated with the specific term and system developed at age 14.

628. Which of the following is the SLOWEST in accessing data?

- Answer: Hard Disk.

- Notes: The speed hierarchy from fastest to slowest is: Register > Cache > RAM > SSD > Hard Disk.

629. Booting by pressing the power button of the computer is also known as:

- Answer: Hard Booting.

- Notes: Cold Booting: Shutting down and starting the computer.

Warm Booting: Restarting the computer.

Random Booting: Automatic restarts caused by bugs or errors.

630. In the formula, which symbol specifies the fixed column or rows in MS Excel 365?

- Answer: Dollar (\$).

- Notes:

- o This concept is called Cell Referencing (locking rows/columns).

- o = (Equals): Starts a formula.

- o & (Ampersand): Concatenates (joins) text.

- o : (Colon): Defines a range.

- o # (Hash): Indicates an error.

- o {} (Curly Brackets): Defines an array.

631. ____ is the most widely used dark web browser. It is free, open source, and available for Windows, Mac, and Linux.

- Answer: Tor Browser.

- Notes: Tor stands for "The Onion Routing". It is often associated with dark web activities.

632. What is the technology behind ChatGPT?

- Answer: Machine Learning.

- Notes:

- o AI: Thinking like a machine.

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- o Machine Learning: Training machines to work (ChatGPT is based on this).
- o Deep Learning: Advanced form involving neural networks and robotics.

633. Microsoft launched Office 365 in which year?

- Answer: 2011.
- Notes: Specifically launched on June 28, 2011. It is the online version of MS Office.

634. What is the minimum and maximum font size available in the dropdown in MS PowerPoint 365?

- Answer: Minimum 8, Maximum 96.
- Notes: This specifically refers to the sizes listed in the dropdown menu.

635. ____ is a type of ROM whose capacity is programmed by the integrated circuit manufacturer.

- Answer: MROM (Mask ROM).
- Notes: This chip is programmed at the time of manufacturing and cannot be changed or reprogrammed later.

636. Which of the following Windows 11 command is used to open the Settings?

- Answer: Windows + I.
- Notes: Mnemonic: "Eye" sounds like "I" for seeing settings.

637. Television and Remote come under which transmission mode of networking?

- Answer: Simplex.
- Notes:
 - o Simplex: One-way communication (TV/Remote).
 - o Half-Duplex: Two-way communication but one at a time (Walkie Talkie).
 - o Full-Duplex: Real-time two-way communication (Mobile Phones).

638. Among these, name the Utility Software.

- Answer: All of these (Antivirus, Disk Cleanup, Disk Defragmenter).
- Notes: Utility software is used to enhance or increase the speed/performance of a computer.

639. Shortcut key for Find and Replace dialog box.

- Answer: Ctrl + H.

640. The Boot Sector files of the system are stored in which computer memory?

- Answer: ROM (Read Only Memory).

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- Notes: BIOS (Basic Input Output System) is also stored in ROM.

641. The ____ layer is in charge of the error-free transport of Data Frames.

- Answer: Data Link Layer.

- Notes: The mention of "Frames" and "MAC Address" always points to the Data Link Layer in the OSI model.

642. ____ was released in ____ as a default browser on Macintosh Personal Computers.

- Answer: Safari; 2003.

- Notes: Safari is Apple's default browser.

643. Size of IPv4 is ____ and IPv6 is ____.

- Answer: 32 bit (IPv4) and 128 bit (IPv6).

- Notes: Additionally, the MAC Address size is 48 bit.

644. Which tool allows contactless payment using a smartphone?

- Answer: NFC (Near Field Communication).

645. Which digital tool is mainly used for Mutual Fund investment?

- Answer: Groww.

646. Huge gap between users and non-users of e-government services is called:

- Answer: Digital Divide.

- Notes: It refers to the gap between those who know how to operate the internet/computers and those who do not.

647. Name the Mother of the Internet.

- Answer: Radia Perlman.

- Notes:

- o Radia Perlman: Developed Spanning Tree Protocol (Mother of Internet).

- o Vint Cerf: Father of Internet.

- o Ada Lovelace: First Programmer.

- o Grace Hopper: Found the first computer bug.

- o Hedy Lamarr: Inventor of WiFi.

648. In Excel 2021, a typical worksheet has ____ column width.

- Answer: 255 characters.

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649. Which programming language is used to implement ChatGPT?

- Answer: Python.

650. Which of the following is used to see all slides at once in MS PowerPoint?

- Answer: Slide Sorter View.
- Notes: This displays slides in a thumbnail format.

651. How can you make the selected character Superscript?

- Answer: Ctrl + Shift + +.
- Notes:
 - o Superscript: x^2 (Ctrl + Shift + +).
 - o Subscript: H_2O (Ctrl + =).

651. What is the largest font size available in the dropdown list of MS Word 365?

- Answer: 72.
- Notes: The smallest size in the dropdown is 8.

652. Which of the following is an example of Absolute Cell Reference in MS Excel 2021?

- Answer: $\$A\9 (Option with two dollar signs).
- Notes:
 - o Relative Reference: A1 (No dollars).
 - o Absolute Reference: $\$A\1 (Dollars before both row and column).
 - o Mixed Reference: $\$A1$ or $A\$1$ (Dollar before only one).

653. Which of the following is also known as Flash Drive?

- Answer: Pen Drive.
- Notes: Flash memory is an advanced form of EEPROM. Devices include Pen Drives, Memory Cards, and SSDs.

654. _____ is a type of malware that pretends to be a useful application but actually contains malicious code.

- Answer: Trojan Horse
- Notes:
 - o It looks beneficial but is not.
 - o Rootkit: Takes administrative rights (root = roots/admin).

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o Adware: Related to advertisement attacks.

o Spyware: Monitors user activity.,

655. Which is the world's fastest supercomputer as per the 2025 Top 500 ranking?

- Answer: El Capitan,
- Notes: This computer was developed by the USA.

656. El Capitan supercomputer achieves performance of around how many Exaflops?

- Answer: 1.8 Exaflops
- Notes: The exact speed is 1.742 Exaflops, which is rounded to 1.8. Supercomputer speed is measured in FLOPS (Floating Point Operations Per Second).

657. Which is the fastest supercomputer in India as of 2025?

- Answer: AIRAWAT,
- Notes: It is an AI supercomputer. It ranks 75th globally but is the fastest within India.

658. AIRAWAT supercomputer is developed by which organization?

- Answer: C-DAC (Centre for Development of Advanced Computing)

659. Which port is commonly used to connect a Pen drive and External Hard Disk?

- Answer: USB (Universal Serial Bus)

660. RJ45 port is used for which type of connection?

- Answer: Ethernet / LAN (Local Area Network)
- Notes: RJ45 stands for Registered Jack 45. RJ11 is used for telephone lines.,

661. Which port supports both high-quality video and audio?

- Answer: HDMI (High Definition Multimedia Interface)
- Notes: Commonly used in Televisions and Projectors.

662. The Email ID of the secondary recipient of an email is entered in which field?

- Answer: CC (Carbon Copy),
- Notes: Primary recipients go in "To". Hidden secondary recipients go in "BCC" (Blind Carbon Copy).

663. Which of the following is NOT a type of broadband internet connection (meaning it is slow)?

- Answer: Dial-up,

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- Notes: Dial-up uses telephone lines and modems and is considered slow compared to Fiber Optic, DSL, or Satellite.

664. What is considered the backbone of the World Wide Web?

- Answer: HTTP (HyperText Transfer Protocol)
- Notes: It is the default communication protocol of the internet.

665. _____ protocol is used for retrieving email from the server.

- Answer: POP3 (Post Office Protocol version 3)
- Notes: POP3 is used to retrieve/receive. SMTP is used to send. IMAP is also used to receive.

666. Which protocol is better suited for configurations where emails need to be accessed only from a single device?

- Answer: POP3,
- Notes: Software like Outlook or Thunderbird often uses POP3. If accessing from multiple devices (like Gmail on phone and laptop), IMAP is used.

667. Which protocol uses Port Number 80 and which uses 443?

- Answer: HTTP uses 80; HTTPS uses 443
- Notes: HTTPS stands for HyperText Transfer Protocol Secure (uses SSL/TLS certificates).

668. What is a Proxy Server also known as?

- Answer: Gateway,
- Notes: A proxy acts on behalf of the user/server, standing at the "gate" to protect the main server.

669. 3.5-inch Floppy Disk by IBM could store how much data?

- Answer: 1.44 MB
- Notes: Other sizes included 5.25 inch (1.2 MB capacity) and 8 inch (1.2 MB capacity).

670. Which memory unit comes after Bit?

- Answer: Nibble
- Notes: Sequence: Bit → Nibble → Byte → KB → MB → GB, etc.
- o 1 Nibble = 4 Bits.
- o 1 Byte = 8 Bits.,

671. The Principle of Locality of Reference justifies the use of _____.

- Answer: Cache Memory

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- Notes: Cache memory keeps frequently required data close to the CPU.
- o Transfer between CPU and Cache = Word Transfer.
- o Transfer between Cache and RAM (Main Memory) = Block Transfer.

672. Choose the Open Source Operating System.

- Answer: All of these (Android, Linux, Open Solaris)
- Notes: Open source means free of cost, editable, and viewable source code. Ubuntu is another example.

673. What is the default file name of MS Excel 2024?

- Answer: Book1,

674. _____ was the first electronic spreadsheet on a microcomputer.

- Answer: VisiCalc

675. _____ is the central component of an OS that manages operations of computer and hardware.

- Answer: Kernel

676. Which language does MS Word use to create Macros?

- Answer: Visual Basic
- Notes: Macros are used for recording repetitive tasks (Shortcut: Alt+F8).

677. How many font effects are there in MS Word 2021/2024?

- Answer: 7
- Notes: Effects include Strikethrough, Double Strikethrough, Superscript, Subscript, Small Caps, All Caps, and Hidden.

678. Which command is used to reboot the computer?

- Answer: Ctrl + Alt + Delete

679. Which shortcut key is used to delete a file permanently in Windows?

- Answer: Shift + Delete
- Notes: This bypasses the Recycle Bin.

680. The keyboard shortcut for inserting a Hyperlink on a selected object in PowerPoint.

- Answer: Ctrl + K

681. Which technology is the baseline for Cryptocurrency transactions?

- Answer: Blockchain

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- Notes: It works on a decentralized methodology.

682. It is a cyber crime in which the attacker floods a server.

- Answer: DDoS (Distributed Denial of Service),

- Notes: Attackers use "Botnets" (robots) to send so many requests that the server shuts down services.

683. In which text are email messages usually encoded?

- Answer: ASCII (American Standard Code for Information Interchange)

684. _____ was a Boot Sector Virus which means it infected the boot sector of a floppy disk.

- Answer: Brain

- Notes: This was the first boot sector virus (made in Pakistan).

685. In how many ways can Email Hacking be done?

- Answer: 3 ways

- Notes: The three ways are Phishing, Man-in-the-Middle attacks, and Password Guessing/Viruses.

686. Name the World's First Programmer.

- Answer: Lady Ada Lovelace

687. Who is the Father of Artificial Intelligence (AI)?

- Answer: John McCarthy

688. The first AI programming language was called _____.

- Answer: LISP (List Processing)

689. The following is the first computer printer.

- Answer: Dot Matrix Printer

690. Who invented the first computer Microphone?

- Answer: Emile Berliner

- Notes:

o Tim Berners-Lee: WWW/HTTP.

o Gary Starkweather: Laser Printer.

o Russell Kirsch: Scanner.

o Charles Babbage: Difference/Analytical Engine.

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691. _____ is a Search Engine of Microsoft.

- Answer: Bing
- Notes: A browser is a software (like Chrome/Edge), a search engine is a website (like Google/Bing).

692. When is World Computer Literacy Day celebrated?

- Answer: December 2nd

693. _____ are used for printing big charts, drawings, maps, and 3D illustrations.

- Answer: Plotters

694. An Email address is made up of how many parts?

- Answer: Two parts
- Notes: The parts are the Username and the Domain Name, separated by the @ symbol.