शिक्षक सेवा आयोग

सूचना तथा सञ्चार प्रविधि (कम्प्युटर) पूर्ण नोट

शिक्षक सेवा आयोग अन्तर्गत माध्यमिक र निम्नमाध्यमिक तहको अनुमतिपत्र परीक्षाको सूचना तथा सञ्चार प्रविधि (कम्प्युटर) को पाठ्यक्रम: २०७८

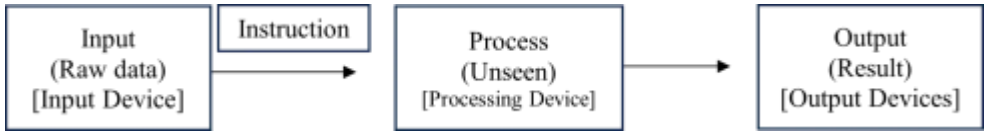
क्र.सं.	शीर्षक	प्रश्न भार	अङ्क भार
१	शिक्षण सिकाइमा कम्प्युटर, इन्टरनेट र जर्नलको प्रयोग		
२	शिक्षण सिकाइमा सूचना, सञ्चार प्रविधिको आवश्यकता र प्रयोग		
३	विद्यालयमा प्रयोग गरिने साधारण सफ्टवेयरको प्रयोग सम्बन्धी आधारभूत ज्ञान ३.१ कम्प्युटर अफिस प्याकेज, कम्प्युटरको उपयोग गरी शिक्षण सिकाइमा उपयोग गर्ने सामग्री निर्माण तथा प्रयोग ३.२ एकीकृत शैक्षिक सूचना व्यवस्थापन प्रणाली (IEMIS) ३.३ शैक्षिक तथ्याङ्क सङ्कलन, विश्लेषण, सम्प्रेषण र प्रयोग		
	जम्मा	**३**	**६**

१. शिक्षण सिकाइमा कम्प्युटर, इन्टरनेट र जर्नलको प्रयोग

१.१ कम्प्युटरको आधारभूत ज्ञान

कम्प्युटरको परिचय (Introduction)

- Computer is an electronic device that works on the **IPO (Input → Process → Output) Cycle**. (कम्प्युटर एउटा विद्युतीय उपकरण हो जसले IPO Cycle मा आधारित भएर काम गर्दछ।)
- The word "Computer" comes from the Latin word "Computare", which means to calculate. ("Computer" शब्द ल्याटिन शब्द "Computare" बाट आएको हो, जसको अर्थ गणना गर्नु हो।)
- Input device takes data → CPU processes it → Output device gives the result. (Input device ले data लिन्छ → CPU ले process गर्छ → Output device ले नतिजा दिन्छ।)



कम्प्युटर प्रणालीका भागहरू (अङ्गहरू) / Parts of Computer System

1. **Hardware Part** (हार्डवेयर भाग) – छुन सकिने भौतिक भागहरु
2. **Software Part** (सफ्टवेयर भाग) – निर्देशनहरूको सेट
3. **Data** (तथ्याङ्क)

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4. **User** (प्रयोगकर्ता)

Hardware Part (हार्डवेयर भाग)

- Computer hardware is the physical component of a computer system that can be touched. (कम्प्युटर हार्डवेयर भनेको कम्प्युटर प्रणालीसँग सम्बन्धित भौतिक अवयव हो, जसलाई छुन सकिन्छ।)
- Examples: keyboard, mouse, monitor, printer, etc. (उदाहरण: किबोर्ड, माउस, मनिटर, प्रिन्टर, आदि।)
- Computer hardware can be mainly divided into the following. (कम्प्युटरका हार्डवेयरलाई मुख्यतया निम्न भागमा विभाजन गर्न सकिन्छ।):
    - इनपुट एकाइ (Input Unit/Device)
    - प्रशोधन एकाइ (Processing Unit/Device)
    - आउटपुट एकाइ (Output Unit/Device)
    - भण्डारण एकाइ (Storage Unit/Device)
    - परिधीय एकाइ (Peripheral Unit/Device)

Input Unit (इनपुट एकाइ)

- Hardware devices that are used for giving input to the computer system are called input devices. (कम्प्युटर प्रणालीमा इनपुट दिन प्रयोग गरिने हार्डवेयर उपकरणलाई इनपुट उपकरण भनिन्छ।)
- Examples: Mouse, Keyboard, Microphone, Scanner, Digital Camera, Light Pen, Joystick, Webcam, etc. (उदाहरण: माउस, किबोर्ड, माइक्रोफोन, स्क्यानर, डिजिटल क्यामेरा, लाइट पेन, जोइस्टिक, वेबक्यामेरा आदि।)

Processing Unit (प्रशोधन एकाइ)

- The unit that processes the data received from the input unit according to the instructions is called the processing unit. (इनपुट एकाइबाट प्राप्त डाटालाई दिइएको निर्देशन अनुसार प्रशोधन (Processing) गर्ने एकाइलाई प्रशोधन एकाइ भनिन्छ।)
- CPU (Central Processing Unit) is the processing unit of the computer. It is also called the Brain of the computer, **Processor** or **Microprocessor**. (CPU लाई कम्प्युटरको दिमाग (Brain), प्रोसेसर तथा माइक्रोप्रोसेसर पनि भनिन्छ।)
- The speed of CPU is measured in Hertz (Hz), nowadays in GHz. (CPU को कार्यक्षमता हर्ज (Hz) मा मापन गरिन्छ; आजकल गिगाहर्ज (GHz) मा।)
- CPU is mainly divided into three parts. (CPU लाई मुख्यतः तीन भागमा विभाजन गरिएको छ।):
    - **CU – Control Unit (कन्ट्रोल एकाइ):**
        - This unit controls all the functions running on the computer system. (यस युनिटले कम्प्युटर प्रणालीमा चलिरहेका सम्पूर्ण कार्यलाई नियन्त्रण गर्छ।)
    - **ALU – Arithmetic Logic Unit (अर्थमेटिक लजिक एकाइ):**
        - This unit performs both arithmetic and logical functions. (यस युनिटले अर्थमेटिक र लजिक दुवै किसिमको कार्य गर्छ।)

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        - Arithmetic refers to operations such as addition, subtraction, multiplication and division. (अर्थमेटिक भन्नाले अङ्कगणितीय कार्य: जोड, घटाउ, गुणा तथा भाग बुझाउँछ।)
        - Logic is the act of comparing any two or more digits and letters. (लजिक कार्य भन्नाले दुई वा बढी अङ्क तथा अक्षरहरू तुलना गर्ने कार्य हो।)
    - **Memory Unit – Register (मेमोरी एकाइ – रजिस्टर):**
        - The memory unit inside the CPU is the Register. (CPU भित्रको मेमोरी एकाइ रजिस्टर हो।)
        - It stores the data and instructions used by ALU and CU. (यसले ALU र CU ले प्रयोग गर्ने data र instructions भण्डारण गर्छ।)
        - The Register is the fastest memory in a computer system. (Register कम्प्युटर प्रणालीको सबैभन्दा छिटो (Fastest) मेमोरी हो।)

Output Unit/Device (आउटपुट एकाइ/उपकरण)

- Hardware devices that are used for providing output from the computer system are called output devices. (कम्प्युटर प्रणालीबाट आउटपुट प्रदान गर्न प्रयोग हुने हार्डवेयर उपकरणलाई आउटपुट उपकरण भनिन्छ।)
- Examples: Monitor, Projector, Printer, Plotter, Speaker, etc. (उदाहरण: मनिटर, प्रोजेक्टर, प्रिन्टर, प्लटर, स्पिकर, आदि।)
- Output devices are further divided into two parts. (आउटपुट उपकरणलाई पनि दुई भागमा विभाजन गर्न सकिन्छ।):
    - **Softcopy output unit (सफ्टकपी आउटपुट एकाइ):** The output unit which displays output in electronic medium. (विद्युतीय माध्यममा देखिने आउटपुट।) Example: Monitor, Projector, Speaker.
    - **Hardcopy output unit (हार्डकपी आउटपुट एकाइ):** The output unit which produces printed output on paper or any other solid surface. (कागज वा अन्य ठोस सतहमा छापिने आउटपुट।) Example: Printer, Plotter.

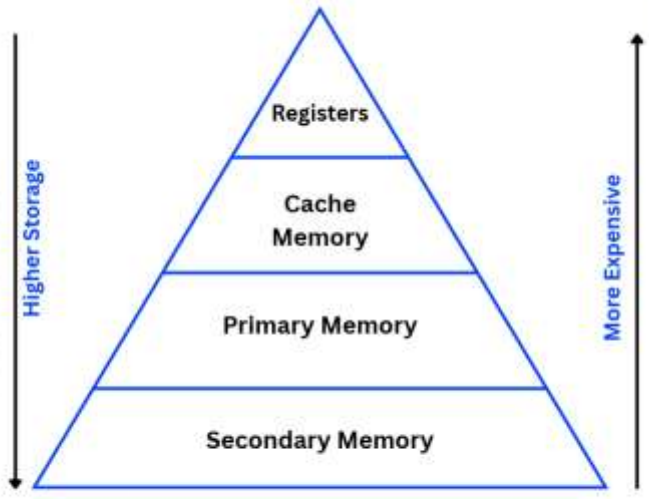
Storage Unit/Device (भण्डारण एकाइ/उपकरण)

- Storage device is hardware capable of holding data and information either temporarily or permanently. (भण्डारण उपकरण भनेको data र information लाई अस्थायी वा स्थायी रूपमा राख्न सक्ने हार्डवेयर हो।)
- The storage unit is mainly divided into two types. (भण्डारण एकाइ मुख्यतया दुई प्रकारमा विभाजित छ।):
    - **Primary storage device (प्राथमिक भण्डारण):**
        - **RAM – Random Access Memory**
            - RAM is an example of volatile memory. (RAM भोलाटाइल मेमोरीको उदाहरण हो।)
            - Volatile memory is a type of memory whose stored contents are lost when system power is turned off. (पावर बन्द हुँदा सामग्री delete हुने मेमोरी।)

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        - RAM can be further divided into: **SRAM** – Static Random Access Memory, **DRAM** – Dynamic Random Access Memory.
    - **ROM – Read Only Memory**
        - The software placed into ROM is called **Firmware**. E.g. BIOS. (ROM मा राखिएको सफ्टवेयरलाई फर्मवेयर भनिन्छ। जस्तै: BIOS)
        - BIOS stands for Basic Input Output System.
        - ROM types: **PROM** – Programmable ROM, **EPROM** – Erasable PROM, **EEPROM** – Electrically EPROM.
  - **Secondary storage device (द्वितीयक भण्डारण):** Such as Hard Disk Drive (HDD), Solid State Drive (SSD), Floppy Disk Drive (FDD), Compact Disc (CD), Digital Versatile/Video Disc (DVD), etc.
- **Peripheral Unit (परिधीय एकाइ):** devices connected outside the CPU such as printer, scanner, external HDD. (CPU बाहिर जोडिने input, output र storage उपकरण।)

Memory Hierarchy (मेमोरी पदानुक्रम):



माथि जाँदा आकार सानो, गति छिटो र मूल्य महँगो; तल जाँदा आकार ठूलो, गति ढिलो र मूल्य सस्तो हुन्छ।

Software Part (सफ्टवेयर भाग)

- Software is a set of instructions or programs that tells a computer what to do. (सफ्टवेयर भनेको कम्प्युटरलाई के गर्ने भनी निर्देशन दिने निर्देशन/प्रोग्रामहरूको सेट हो।)
- Terminologies used for S/W (सफ्टवेयरका अर्को नाम): Logical Component (तार्किक तत्व), Untouchable Component (छुन नसकिने तत्व), Intangible Component (अमूर्त तत्व)।
- Software is divided into three types. (सफ्टवेयरलाई तीन प्रकारमा विभाजन गरिन्छ।):
    - System Software
    - Application Software

- Programming Software

System Software

- System software is software that is designed to operate, manage and control computer hardware and its functions. (कम्प्युटर हार्डवेयरलाई सञ्चालन, व्यवस्थापन र नियन्त्रण गर्न बनाइएको सफ्टवेयर।)
- Types / Examples:
  - **Operating System (OS):** acts as an interface between the computer user and the hardware. (प्रयोगकर्ता र हार्डवेयर बीचको मध्यस्थकर्ता।) Examples: MS DOS, Windows XP/7/10/11, Linux, Unix, iOS, etc.
  - **Device Driver:** E.g. Printer driver, Sound driver.
  - **Utility Software:** Antivirus, Disk defragmenter.

Application Software

- Application software is software designed for the use of a computer user. (प्रयोगकर्ताको कामका लागि बनाइएको सफ्टवेयर।)
- It is further divided into two types:
  - **Package Application Software:** a collection of software, same for all users. Example: Microsoft Office package. (धेरै सफ्टवेयरको सङ्ग्रह; सबै प्रयोगकर्ताका लागि एउटै।)
  - **Tailored (Customized) Application Software:** developed for a specific person or organization's requirements. Example: Billing software. (कुनै व्यक्ति वा संस्थाको आवश्यकता अनुसार बनाइएको।)

Programming Software

The software used to create other software is called programming software. (अन्य सफ्टवेयर बनाउन प्रयोग हुने सफ्टवेयर।) Example: Compiler, Interpreter, Editor.

Programming Language

- Computer language is mainly divided into two parts. (कम्प्युटर भाषा मुख्यतः दुई भागमा विभाजित छ।): Low Level Language (LLL), High Level Language (HLL).
- **Low Level Language (LLL)** is further divided into two types:
  - **Machine Level Language (MLL):**
    - It is known as 1st Generation Language. (पहिलो पुस्ताको भाषा।)
    - It has only two digits i.e. 0 & 1. (० र १ मा मात्र कार्य गर्दछ।)
    - It is the Computer's Mother Language, so it is directly understood by computer. (कम्प्युटरको मातृभाषा हो, सिधै बुझ्छ।)
    - It does not require any language processor.
  - **Assembly Language (ASM):**
    - It is known as 2nd Generation Language.
    - It uses letters and numbers (mnemonic codes) for instructions.
    - **Assembler** is used to convert Assembly language into Machine language.
- **High Level Language (HLL):**

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    - It is known as 3rd Generation Language.
    - It is English-like structure language. Example: C, C++, Java, Visual Basic and JavaScript.
    - It requires a translator (Compiler/Interpreter) to convert Source code into Object code.
- **Source Code:** Source code refers to high level or assembly code written by a human programmer. (प्रोग्रामरले लेखेको कोड।)
- **Object Code:** Object code refers to low level code understood by the machine, generated after going through a translator. (मेसिनले बुझ्ने कोड।)
- **Computer Programmer:** A person who writes computer programs is called a computer programmer. (कम्प्युटर प्रोग्राम लेख्ने व्यक्ति।) **Lady Augusta Ada Lovelace** is known as the first computer programmer. (पहिलो कम्प्युटर प्रोग्रामर।)
- **Language Processor/Translator/Converter:** software used to translate source code into object code. (स्रोत कोडलाई object code मा अनुवाद गर्ने सफ्टवेयर।)
    - **Assembler (असेम्बलर):** translates assembly language into machine language. (Assembly language लाई machine language मा बदल्छ।)
    - **Compiler and Interpreter (कम्पाइलर र इन्टरप्रिटर):** Both are used for converting HLL into MLL.
        - Compiler translates the whole program at once. (सम्पूर्ण प्रोग्रामलाई एकैपटक अनुवाद गर्छ।)
        - Interpreter translates one statement at a time. (एक पटकमा एउटा statement अनुवाद गर्छ।)

Characteristics of Computer (कम्प्युटरका विशेषताहरू)

- **Speed (तीव्रता):** Computer can work very fast. It takes only a few seconds for calculations that take hours for humans. (घण्टौं लाग्ने काम सेकेन्डमै गर्छ।) Computer can perform millions of instructions every second.
    - Computer speed is measured in microsecond, nanosecond and picosecond. Note:
        - 1 millisecond = 10^{-3} or 1/1000 seconds
        - 1 microsecond = 10^{-6} or 1/1000000 seconds
        - 1 nanosecond = 10^{-9} or 1/1000000000 seconds
        - 1 picosecond = 10^{-12} or 1/1000000000000 seconds
- **Accuracy (शुद्धता):** The degree of accuracy of computer is very high. (कम्प्युटरको शुद्धता धेरै उच्च हुन्छ।) The errors in computer are due to human and inaccurate data. It follows **GIGO (Garbage In Garbage Out)**. (गल्ती भए Input गर्ने मान्छेका कारण हुन्छ।)
- **Diligence (लगनशीलता):** A computer is free from tiredness; it can work for hours without making mistakes. (कम्प्युटर थाक्दैन।)
- **Versatility (बहुमुखी प्रतिभा):** It means the capacity to perform completely different types of work. (धेरै किसिमका फरक काम गर्न सक्ने क्षमता।)
- **Automation (स्वचालित):** Computer performs all tasks automatically i.e. without manual intervention. (मानवीय हस्तक्षेप बिना काम गर्छ।)

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- **Mass Storage Capacity (ठूलो मात्रामा भण्डारण क्षमता):** Computer has large storage areas where it can store a large amount of data.
- **No IQ and No Feelings:** Computer is a dumb machine and it cannot do any work without instruction from the user. It does not have feelings, emotion, taste, knowledge and experience. (कम्प्युटरमा भावना, स्वाद, ज्ञान र अनुभव हुँदैन।)

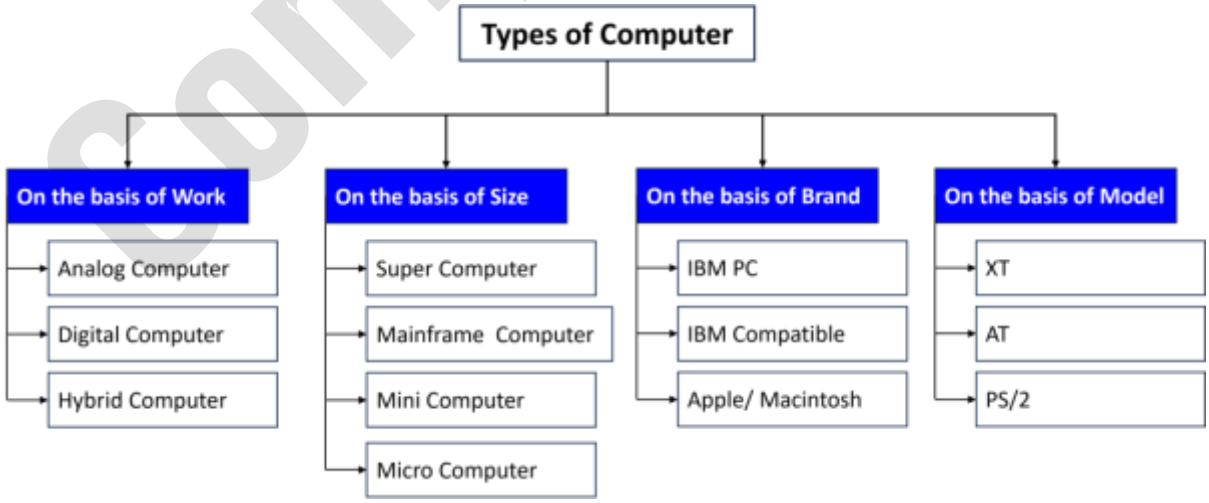
Limitations of Computer (कम्प्युटरका सीमाहरू)

- Lack of Intelligence (बुद्धिमत्ताको कमी)
- Lack of Common Sense (सामान्य बोधको कमी)
- Lack of Decision Making (निर्णय क्षमताको कमी)
- Risk of Virus threats (भाइरसको खतरा)
- Note: Versatility कम्प्युटरको विशेषता हो, सीमा होइन (परीक्षामा सोधिने तरिका)।

Application of Computer (कम्प्युटरका प्रयोग क्षेत्रहरू)

- **Education (शिक्षा):** Online classes, e-library, distance learning show the use of computer in education.
- **Banking (बैंक):** Mobile banking, Internet banking, ATM, QR scan, PhonePay are the emerging uses of computer in banking sector. (मोबाइल बैंकिङ, इन्टरनेट बैंकिङ, ATM, QR स्क्यान आदि।)
- **Communication (सञ्चार):** Email, Video Conferencing, file transfer etc. are the use of computer in the field of communication.
- **Entertainment (मनोरञ्जन):** Computer Games, Music Videos, Movies, Cartoons etc. are the great source of entertainment produced by computer users.
- **Advertisement (प्रचार):** Designing realistic ads, producing animated ads, showing ads on big screens, etc.

Types of Computer (कम्प्युटरका प्रकार)



- **On the basis of Working Principle (काम गर्ने सिद्धान्तका आधारमा):** Analog | Digital | Hybrid

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- **Analog Computer (एनालग कम्प्युटर):** It operates on analog signals. It operates on continuous data like pressure, temperature, frequency. It is a special purpose computer. The accuracy rate of analog computer is low. (शुद्धता कम।)
- **Digital Computer (डिजिटल कम्प्युटर):** It operates on digital signals. It operates on discrete data like numbers. It is a general purpose computer. The accuracy rate of digital computer is high. (शुद्धता उच्च।)
- **Hybrid Computer (हाइब्रिड कम्प्युटर):** Hybrid computer = Analog computer + Digital computer. It is also a special purpose computer.

- **On the basis of Size (आकारका आधारमा):** Super | Mainframe | Mini | Micro
  - **Super Computer (सुपर कम्प्युटर):** It is the largest and most powerful computer. (सबैभन्दा ठूलो र शक्तिशाली।)
  - **Mainframe Computer (मेनफ्रेम कम्प्युटर):** It is also a large computer but somewhat smaller than a super computer. (सुपर भन्दा केही सानो।)
  - **Mini Computer (मिनी कम्प्युटर):** It is medium size computer. (मध्यम आकारको।)
  - **Micro Computer (माइक्रो कम्प्युटर):** It is smaller in size. Microprocessor is used in micro computers. (सानो आकारको; माइक्रोप्रोसेसर प्रयोग हुन्छ।) Types: **Desktop, Laptop, Palmtop**, etc.

History of Computer (कम्प्युटरको इतिहास)

- The term "computer" is derived from the Latin word "computare" which means to calculate. ("Computer" शब्द ल्याटिन शब्द "computare" बाट बनेको हो।)
- The father of computers is called **Charles Babbage**. (कम्प्युटरका पिता चार्ल्स ब्याबेज।)
- The **ABACUS** is the first used device in the field of computation. (गणनाको क्षेत्रमा पहिलो प्रयोग भएको उपकरण अबाकस।)
- The basic architecture of Computer is developed by **John Von Neumann**. (कम्प्युटरको आधारभूत आर्किटेक्चर जोन भोन न्युम्यानले विकास गरेका हुन्।)

Date	Events
Around 3000 B.C. ago	**Abacus** is invented by Chinese businessmen. It is the earliest calculating device. It is also called counting frame.
In 1613	The word "Computer" is first time used, derived from Latin word "Computare", which means to calculate.
1614	**Logarithm table** – Invented by John Napier
1617	**Napier's Bones** – Invented by John Napier. It is based on Logarithm table. It is much like ABACUS.
1621	**Slide Rule** – Invented by William Oughtred

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Date	Events
1630	**Modern Slide Rule** – Invented by William Oughtred
1642	**Pascaline – first mechanical calculator** – Invented by Blaise Pascal. It is also called First Mechanical Calculator.
1671	**Stepped Gear Mechanism**
1801	**Punch card (Mechanical loom)** – Invented by Joseph Marie Jacquard
1821	**Arithmometer** – Developed by Charles Xavier Thomas de Colmar. It is termed as commercially successful digital mechanical calculator.
1822	**Difference Engine – First Automatic Computer Machine** – Designed by Charles Babbage. It is able to compute tables of numbers. It is known as first Mechanical Automatic Computer.
1837	**Analytical Engine – First General Purpose Computer** – Designed by Charles Babbage. It is known as First General-Purpose Mechanical Computer. It contains: ALU, Basic Flow Control, Punch card, Integrated Memory.
1890	**Hollerith's machine – The first machine to record and store information** – Developed by Herman Hollerith. Developed a method for machines to record and store information on punch cards for the US census. Hollerith later formed the company we know today as IBM.
Between 1936 and 1938	**Z1 – First Programmable Computer** – Created by German Konrad Zuse. It is considered to be the first electromechanical binary programmable computer, and the first functional modern computer.
1936	**Turing Machine** – proposed by Alan Turing. Became the foundation for theories about computing and computers.
1937	**ABC – The first digital computer (Special Purpose)** – ABC stands for Atanasoff-Berry Computer. Developed by John Vincent Atanasoff and graduate student Cliff Berry. The ABC was an electrical computer. Cannot be programmed.
1943	**Colossus – The first electronic Digital Programmable Computer** – developed by Tommy Flowers. It was created to help the British code breakers read encrypted German messages.
1946	**ENIAC – The first digital computer (General Purpose)** – ENIAC stands for Electronic Numerical Integrator and Computer. Built by John Mauchly and J. Presper Eckert. It is the first purposed General purpose electronic digital computer. Can be programmed.

Strong Note: The ABC's priority is debated among historians of computer technology, because it was neither programmable, nor Turing-complete. Although a judge later ruled the

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ABC computer was the first digital computer, many consider the ENIAC to be the first digital computer because it was fully functional. (ABC लाई कतिपयले पहिलो digital computer मान्छन्, तर धेरैले ENIAC लाई।)

History of Computer in Nepal (नेपालमा कम्प्युटरको इतिहास)

Date	Events
2028 B.S.	**IBM 1401** – It is the first computer brought to Nepal. It is second generation mainframe computer. It is used for census. (नेपालमा आएको पहिलो कम्प्युटर, जनगणनाको लागि ल्याइएको।)
2031 B.S.	**NCC established** – NCC stands for National Computer Center.
2038 B.S.	**ICL 2950/10** – This is the second computer brought to Nepal. It is third generation computer. It is used for census. (दोस्रो कम्प्युटर।)

Generations of Computer (कम्प्युटरका पुस्ताहरू)

First Generation Computer (पहिलो पुस्ता)

विवरण	First Generation
Time Period	1946–1958
Main Component	Vacuum tubes (almost 18000 vacuum tubes used in the computer)
Primary Memory	Magnetic core
Secondary Memory	Magnetic drum, Magnetic tape
Operating System	Batch Processing OS
Processing (Operating) Speed	Very slow (Millisecond)
Programming Language	Machine Level Language (MLL)
Input (Device)	Punch card, Paper tape
Output (Device)	Printing device
Size	Enormous/Huge, taking up entire rooms (32 tons)
Heat Production	Maximum (additional cooling devices required)
Cost	Very expensive
Use	Simple mathematical calculation
Examples	UNIVAC, ENIAC, EDVAC, IBM-701, IBM-650

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The **UNIVAC** was the first commercial computer delivered to a business client, the U.S. Census Bureau in 1951. (UNIVAC पहिलो व्यावसायिक कम्प्युटर।)

Second Generation Computer (दोस्रो पुस्ता)

विवरण	Second Generation
Time Period	1959–1965
Main Component	Transistor
Primary Memory	Magnetic core
Secondary Memory	Magnetic tape, Magnetic drum
Storage Capacity	Higher than first generation
Operating System	Batch Processing
Processing (Operating) Speed	Microsecond
Programming Language	Assembly language, MLL
Input (Device)	Punch card
Output (Device)	Printers
Size	Smaller than first generation
Heat Production	Less
Cost	Very expensive
Use	Complex scientific calculation, population census, etc.
Examples	IBM 1401, IBM 1400

Third Generation Computer (तेस्रो पुस्ता)

विवरण	Third Generation
Time Period	1966-1970
Main Component	IC (Integrated Circuit)
Primary Memory	Semiconductor memory (silicon)
Secondary Memory	Magnetic tape, magnetic disk like floppy disk, hard disk, etc.
Storage Capacity	Higher than previous generation

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विवरण	Third Generation
Operating System	Multiprogramming
Processing (Operating) Speed	Nanosecond
Programming Language	HLL: FORTRAN, COBOL, PASCAL, C, C++, etc.
Input (Device)	Keyboard
Output (Device)	Monitor
Size	Medium
Heat Production	Less
Cost	Expensive
Use	Bank, Insurance company, population census, etc.
Examples	Mini computer was developed in this generation. IBM 360, IBM 370, PDP-8

Fourth Generation Computer (चौथो पुस्ता)

विवरण	Fourth Generation
Time Period	1971–Present
Main Component	VLSI / Microprocessor
Primary Memory	RAM and ROM
Secondary Memory	HDD, SSD
Storage Capacity	GB, TB
Operating System	Windows, MacOS
Processing (Operating) Speed	Nano Second
Programming Language	HLL: JAVA, C++
Input (Device)	Light pen, touchpad, etc.
Output (Device)	Projector, Monitor, etc.
Size	Small
Heat Production	Very less

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विवरण	Fourth Generation
Cost	Cheap
Use	Almost everywhere: House, School, etc.
Examples	Laptop, Desktop, Palmtop

Fifth Generation Computer (पाँचौं पुस्ता)

- Time Period: 1980–Present onwards.
- Fifth generation computing devices, based on **artificial intelligence**, are still in development. (कृत्रिम बुद्धिमत्तामा आधारित, अझै विकासको क्रममा।)
- Some more features of 5th Generation Computer are: Parallel Processing, Bio-chip, Natural Language Processing, Quantum Computing, Nanotechnology, Voice Recognition.

१.२ इन्टरनेट (Internet)

कम्प्युटर सञ्जाल (Computer Network)

- A Computer network is a collection of computers, network devices, or other devices connected to allow data sharing. (कम्प्युटर नेटवर्क भनेको डाटा आदान-प्रदान गर्न जोडिएका कम्प्युटर, नेटवर्क डिभाइस वा अन्य उपकरणको सङ्ग्रह हो।)

कम्प्युटर सञ्जालका प्रकार (Types of Computer Network)

On the basis of Geographical Spread (भौगोलिक विस्तारका आधारमा)	On the basis of User Access or Ownership (पहुँच वा स्वामित्वका आधारमा)
LAN – Local Area Network Coverage: Within Single Building. Example: Home Network (Wi-Fi).	**Intranet:** कुनै संस्था भित्र सञ्चार, file transfer र official कामका लागि बनाइएको Private, Internal network। अधिकृत प्रयोगकर्ताले मात्र प्रयोग गर्न सक्छन्।
MAN – Metropolitan Area Network Coverage: Within Single City. Connect various LANs. Example: Business Network with Multiple Branch.	**Extranet:** Extranet भनेको संस्थाका partner, vendor, supplier, customer आदिलाई संस्थासँग जोड्ने Private network हो।
WAN – Wide Area Network Coverage: All over the World. Connect various MANs. Example: Internet.	**Internet:** सार्वजनिक विश्वव्यापी network।

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Points to remember

- ARPANET लाई पहिलो Computer Network मानिन्छ। (ARPANET stands for Advanced Research Projects Agency Network.) विगतमा इन्टरनेटलाई ARPANET नै भनिन्थ्यो।
- **Vint Cerf** लाई Internet का पिता भनिन्छ।
- Internet लाई **Information Superhighway** पनि भनिन्छ।
- Protocol भनेको network मा सूचना तथा data आदान-प्रदान गर्न प्रयोग हुने नियम तथा निर्देशनहरूको सेट हो।
- **World Wide Web (WWW)** लाई छोटकरीमा Web भनिन्छ। Web भनेको Server computer हरूमा भण्डार गरिएका data तथा Website हरूको सङ्ग्रह हो, जसलाई Internet माध्यमबाट access गरिन्छ।
- **Web Browser** भनेको WWW access गर्न प्रयोग गरिने software हो।

इन्टरनेटको इतिहास (History of Internet)

- सन् १९६९ मा ARPANET बनाइयो।
- जनवरी १, १९८३ मा ARPANET मा **TCP/IP** को प्रयोग भयो र फरक-फरक किसिमका computer तथा network बीच Communicate गर्न सम्भव भयो। यसैलाई इन्टरनेटको आधिकारिक जन्मदिन मानिन्छ।
- १९८९/१९९० मा **Tim Berners-Lee** ले WWW को सुरुवात गरे र इन्टरनेट सबैका लागि संसारभर फैलियो।

नेपालमा इन्टरनेटको इतिहास (History of Internet in Nepal)

- सन् १९९४ मा Mercantile Communication Pvt. Ltd. (ISP) ले नेपालमा पहिलो पटक commercial e-mail service सुरु गऱ्यो; यसैबाट नेपालमा इन्टरनेटको सुरुवात भयो।
- सन् १९९५ मा अर्को ISP **World Link** स्थापना भयो; यही वर्ष Mercantile र World Link ले **Dial-Up Internet** सुरु गरे।
- सन् २००३ मा World Link ले Commercial ISP को रूपमा **Wireless** सेवा सुरु गऱ्यो।
- सन् २००५ मा **Subisu** ले केवल इन्टरनेट सेवा सुरु गऱ्यो र त्यसपछि Dial-up को प्रयोग घट्दै गयो।
- सन् २००८ मा **ADSL** internet सुरु भयो (त्यसपछि Mobile internet पनि)।
- **Vianet** ले नेपालमा **Fiber optic** internet सुरु गऱ्यो।

इन्टरनेटका सेवाहरू (Services of Internet)

- **Email**
- **Video Conference**
- **File Sharing**
- **E-commerce**
- **Telnet**, **Usenet**, **Newsgroup** (समाचार समूह)
- **WWW or Web**

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इमेल / ई-मेल (Email / E-mail)

- E-mail stands for Electronic Mail. (E-mail भनेको Electronic Mail हो।)
- E-mail is a method of exchanging messages ("mail") between people using electronic devices via a network. (Network मार्फत electronic उपकरण प्रयोग गरेर व्यक्तिहरू बीच सन्देश आदान-प्रदान गर्ने विधि।)
- E-mail मा text का साथै Audio, Video, Graphics जस्ता file attachment पनि राख्न सकिन्छ।
- The father of email is **Raymond Samuel Tomlinson**. (इमेलका पिता रेमन्ड स्यामुएल टमलिन्सन।)

२. शिक्षण सिकाइमा सूचना, सञ्चार प्रविधिको आवश्यकता र प्रयोग (The need and use of ICT in teaching and learning)

ICT भनेको के हो? (What is ICT?)

- ICT stands for **Information and Communication Technology**. (सूचना तथा सञ्चार प्रविधि।)
- ICT is the communication system of interactive information exchange using computing devices and software. (Computing device र software को प्रयोग गरेर गरिने अन्तरक्रियात्मक सूचना आदान-प्रदान तथा सञ्चार प्रणाली।)
- ICT, Multimedia भएको अन्तरक्रियात्मक (interactive) सूचनाको सञ्चार हो।

Multimedia भनेको के हो? (What is Multimedia?)

- Multimedia भनेको कम्प्युटरमा आधारित अन्तरक्रियात्मक सञ्चार प्रक्रिया हो, जसमा text, graphics, audio, video र animation समावेश हुन्छन्। (Computer based interactive communication process that incorporates text, graphics, audio, video and animation.)

Components of Multimedia (मल्टिमिडियाका भागहरू):

1. Text (पाठ)
2. Graphics (दृश्य)
3. Audio (श्रव्य)
4. Video (दृश्य-श्रव्य)
5. Animation (सजीवता)

Note: Printer Multimedia को component होइन (Output device हो)।

ICT लाई शिक्षामा प्रयोग गर्नुका फाइदाहरू (Advantages of ICT in Education)

- विद्यार्थीको पढाइप्रति रुचि बढाउँछ।
- Interactivity प्रदान गर्छ; विद्यार्थी कक्षामा अनुपस्थित हुँदैनन्।
- विद्यार्थीहरू बीचको सहकार्य (collaboration) मा मद्दत गर्छ।
- रचनात्मकता (creativity) र सञ्चार (communication) बढाउन मद्दत गर्छ।
- सजिलै बुझ्न सकिने बनाउँछ।

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शिक्षण सिकाइमा सूचना तथा सञ्चार प्रविधिको प्रयोग (Use of ICT in Education)

- **Educational Software**
- **Online Learning Platform:** Some of online learning platforms includes: Coursera, Skillshare, Udemy, Codecademy, Edx, Pluralsight, FutureLearn, Moodle, E-Paath, MiDas eClass, Neema Academy, mySecondTeacher, etc.
- **Online Learning Types:** Asynchronous Online Learning (समय फरक, पहिले रेकर्ड गरिएको) and Synchronous Online Learning (एकै समय, live)।
- **E-library – Electronic Library**
- **Virtual Reality (VR) Technology**

इ-पुस्तकालय भनेको के हो? (What is e-library?)

- E-library stands for Electronic Library. It is also called Digital Library, an online library, an internet library, a digital repository, or a digital collection. (इ-पुस्तकालय भनेको Electronic Library हो।)
- इन्टरनेटमा विभिन्न सामग्री उपलब्ध गराउँछ; भौतिक पुस्तकालयको digital/virtual रूप हो।
- नेपालको शैक्षिक केन्द्रित निःशुल्क र खुला digital पुस्तकालयमध्ये एक: **"ई-पुस्तकालय" (E-Pustakalaya)**।

थप अध्ययनका लागि (सामान्य ज्ञानका आधारमा)

- **Journal (जर्नल) को प्रयोग:** शोध लेख र शैक्षिक अध्ययन पढ्न/प्रकाशन गर्न। E-journal इन्टरनेटबाट पढ्न सकिन्छ; शिक्षकले आफ्नो विषयको नयाँ ज्ञान र teaching method सिक्न प्रयोग गर्छन्।
- **ICT को महत्व:** पहुँच (access) बढाउँछ, समय र खर्च बचत गर्छ, दूरशिक्षा सम्भव बनाउँछ, सामग्री निर्माण र मूल्याङ्कन सजिलो बनाउँछ।
- **चुनौती:** Internet/बिजुली/device को अभाव, शिक्षकको digital skill कमी, खर्च, Cyber safety र गलत सूचनाको खतरा।
- **ध्यान दिनुपर्ने कुरा:** उद्देश्य अनुसार सही सामग्री छनोट, copyright र सुरक्षाको ख्याल, सबै विद्यार्थीको समान पहुँच, ICT लाई शिक्षणको सहायक साधनको रूपमा प्रयोग।

३. विद्यालयमा प्रयोग गरिने साधारण सफ्टवेयरको प्रयोग सम्बन्धी आधारभूत ज्ञान (Basic knowledge about the use of general software used in school)

विद्यालयमा प्रयोग गरिने साधारण सफ्टवेयर भनेको के हो? (What is the software used in school?)

- The software used in school is known as Educational Software. (विद्यालयमा प्रयोग गरिने सफ्टवेयरलाई शैक्षिक सफ्टवेयर भनिन्छ।)
- Educational software refers to computer software that is designed for educational purposes. (शैक्षिक उद्देश्यका लागि प्रयोग हुने कम्प्युटर सफ्टवेयर।)
- The purpose of educational software is to make education more effective and efficient. (शिक्षालाई अझ प्रभावकारी र प्रभावशाली बनाउनु यसको उद्देश्य हो।)

विद्यालयमा प्रयोग हुने साधारण सफ्टवेयरहरू (Common software used in schools):

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- **Graphics software:** MS Paint, etc. – File Extension: .bmp / .png
- **Text editor software:** Notepad – File Extension: .txt
- **Word processing software:** WordPad (.rtf), MS Word (.docx), etc.
- **Electronic spreadsheet software:** MS Excel, etc.
- **तथ्याङ्क व्यवस्थापन सफ्टवेयर:** IEMIS, etc.

३.१ अफिस प्याकेज – वर्ड, एक्सेल, पावर प्वाइन्ट (Office Package – Word, Excel, PowerPoint)

अफिस प्याकेज भनेको के हो? (What is Office Package?)

- माइक्रोसफ्टले अफिसियल कामकाजका लागि बनाएको applicaiton सफ्टवेयरको समूहलाई अफिस प्याकेज भनिन्छ। (The group of application software developed by Microsoft for official work is called "Office Package".)
- Microsoft Office is also called Microsoft Office Suite, Office Suite, Office Bundle, Office Family.

Versions of Microsoft Office (माइक्रोसफ्ट अफिसका संस्करणहरू)

Office 1.0 (1990, Windows का लागि) → Office 95 → Office 97 → Office 2000 → Office XP → Office 2003 → Office 2007 → Office 2010 → Office 2013 → Office 2016 → Office 2019 → Office 2021। **"Office 2009" भन्ने version छैन** (परीक्षामा सोधिन्छ)।

Parts of Microsoft Office (माइक्रोसफ्ट अफिसका भागहरू)

Program	Description	File name	Extension (New | Old)
MS Word	Microsoft Word is a full-featured word processing program	Document	.docx | .doc
MS Excel	Microsoft Excel is a spreadsheet program that features calculation, graphic tools, etc.	Workbook	.xlsx | .xls
MS PowerPoint	Microsoft PowerPoint is a presentation program	Presentation	.pptx | .ppt
MS Access	Microsoft Access is a database management system (Relational DBMS)	Database	.accdb | .mdb

MS Word

- MS Word stands for Microsoft Word. (माइक्रोसफ्ट वर्डको छोटो रूप।)
- Microsoft Word is word processing software. It is developed by Microsoft and is part of Microsoft Office Suite. (माइक्रोसफ्टद्वारा विकसित, Office Suite को भाग।)

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- It enables you to create, edit and save professional documents like letters and reports. (पत्र र प्रतिवेदन जस्ता कागजात बनाउन, सम्पादन र सुरक्षित गर्न सकिन्छ।)
- **File Name:** Document (डकुमेन्ट)
- **File type (Extension):** .docx (new) | .doc (old)
- **Run Command** for opening MS Word is: winword.exe

MS Word Important Shortcuts:

Function	Shortcut key
Create New Document	Ctrl+N
Save Document	Ctrl+S, Shift+F12, Alt+Shift+F2
Open existing Document	Ctrl+O, Ctrl+F12
Print document	Ctrl+P
Print Preview	Ctrl+F2, Ctrl+Alt+I
Copy	Ctrl+C, Ctrl+Insert
Cut	Ctrl+X, Shift+Delete
Paste	Ctrl+V, Shift+Insert
Paste Special	Ctrl+Alt+V
Format Painter	Ctrl+Shift+C – Copy Format, Ctrl+Shift+V – Paste Format
Select All	Ctrl+A
Underline / Double Underline / Word underline	Ctrl+U / Ctrl+Shift+D / Ctrl+Shift+W
Change Case	Shift+F3
Line Height	Ctrl+1 – Single spacing, Ctrl+2 – Double spacing, Ctrl+5 – 1.5 line spacing
Proofing	F7 – Spelling check, Alt+Click – Research, Shift+F7 – Thesaurus, Ctrl+Shift+G – Word Count
Apply Styles	Ctrl+Shift+S
Notes	Alt+Ctrl+F – Insert Footnote, Alt+Ctrl+D – Insert Endnote
Insert equation	Alt+=
Date and Time	Alt+Shift+D – Insert Current Date, Alt+Shift+T – Insert Current Time
Bookmark	Ctrl+Shift+F5
Follow hyperlink	Ctrl+Click

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Function	Shortcut key
Symbols	Alt+Ctrl+C – ©, Alt+Ctrl+R – ®, Alt+Ctrl+T – ™, Alt+Ctrl+E – €
Macros	Alt+F8 – macro dialog box, Alt+F11 – VB application
Field Code	Alt+F9 – Display/show Field Code, Ctrl+F9 – Insert Field Code, Shift+F9 – Edit the field, F9 – update the field

Navigation Shortcuts:

Shortcut	Action
Right arrow / Left arrow	Moves the cursor one character right / left
Ctrl + Right arrow / Ctrl + Left arrow	Moves the cursor one word right / left
Up Arrow / Down Arrow	Moves the cursor one line up / down
Ctrl + Up Arrow / Ctrl + Down Arrow	Moves the cursor one paragraph up / down
Home / End	Moves the cursor to the beginning / end of the line
Ctrl + Home / Ctrl + End	Moves the cursor to the beginning / end of the document
Page Up / Page Down	Moves the cursor one screen up / down
Ctrl + Page Up / Ctrl + Page Down	Moves the cursor one page up / down

MS Excel

- MS Excel stands for Microsoft Excel. (माइक्रोसफ्ट एक्सेलको छोटो रूप।)
- Microsoft Excel is Spreadsheet program. It is developed by Microsoft and is part of Microsoft Office Suite. (गणना र chart का लागि प्रयोग हुने Spreadsheet program।)
- It is used to create simple to complex data/numerical spreadsheets calculations. (सरल देखि जटिल गणनाका लागि।)
- **File Name:** Workbook (वर्कबुक)
- **File type (Extension):** .xlsx (new) | .xls (old)
- **Run Command** for opening MS Excel is: excel.exe

Excel Related Terminologies:

- **Cell (कक्ष):** It is the intersection of row and column. (Row र Column को प्रतिच्छेदन।) Cell is Data holding place/unit. For Example: A1
- **Row (पङ्क्ति):** Rows are the horizontal lines in the worksheet. Each row is labeled by Numbers (Row Heading). In the 2003 worksheet, the total row is 65,536; Excel 2007 and newer version contains **10,48,576** rows.

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- **Column (स्तम्भ):** Columns are the vertical lines in the worksheet. Each column is labeled by Alphabet (Column Heading). In Excel 2003 worksheet, the total columns are 256 (IV); In Excel 2007 and newer version worksheet, the total columns are **16,384 (XFD)**.
- **Worksheet (वर्कसिट):** A worksheet is a page of Workbook. A worksheet is a single page containing a collection of cells where the user can store, update and manipulate the data. Worksheet is also called a **spreadsheet**. It is also known as working area of excel.
- **Workspace:** Collection of multiple workbooks is called Workspace.
- **Workbook:** The Excel file is called workbook. Workbook is the collection of worksheet and chart sheet. It contains many sheets like: Worksheet, Chart Sheet, Dialogue Sheet, Macro Sheet/Module Sheet etc.
- Excel मा सबै **formula** "=" बाट सुरु हुन्छ। Excel मा **SUM, MAX, MIN, AVERAGE** function छन्; "AVG" function होइन।

Excel Important Shortcuts:

Shortcut key	Function
Ctrl+N / Ctrl+S / Ctrl+O	Create New Workbook / Save Workbook / Open existing dialog box
Ctrl+Tab	To switch between open workbooks
Ctrl+F9 / Ctrl+F10	To minimize / maximize the current workbook window
F1 / F2	Help / To edit cell
F12	Save as dialog box
Shift+F11, Alt+Shift+F1	Insert new worksheet
Ctrl+Page Down / Ctrl+Page Up	Move to Next sheet or shift to the Right / Previous sheet to the Left
Tab / Shift+Tab	Move to next cell / previous cell
Shift+F5	Find and Replace box / search box
Ctrl+C / Ctrl+X / Ctrl+V	Copy / Cut / Paste
Ctrl+1	Open Format Cell Dialog Box
Ctrl+2 / Ctrl+3 / Ctrl+4 / Ctrl+5	Bold Text / Italic Text / Underline Text / Strikethrough
Ctrl+9 / Ctrl+0	Hide Row / Hide Column
Alt+Enter	Wrap Text (new line inside cell)
Ctrl+Shift+1	Format Number in Number Format, or say Comma Format
Ctrl+Shift+2	Format Number in Custom Format (time)

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Shortcut key	Function
Ctrl+Shift+3	Format Number in Custom Format (date)
Ctrl+Shift+4	Format Number in Currency Format
Ctrl+Shift+5	Format Number in Percentage Format
Ctrl+Shift+6	Format Number in Scientific Format
Ctrl+Shift+7	Apply outside borders
Alt+=	AutoSum
Ctrl+D / Ctrl+R	Fill Down / Fill Right
Ctrl+T / Ctrl+K	To Insert Table / To Create Hyperlink
F11 / Alt+F1	Insert Chart sheet / Creates a chart of the data in the current range
Ctrl+F3	Name Manager
F9 / Shift+F9	Calculate Entire workbook / Calculate Current Sheet
Ctrl+` (tilde)	Show formula
Ctrl+E	Flash Fill (in 2013 and above version)
Ctrl+Shift+L	Filter
Alt+F5 / Ctrl+Alt+F5	Refresh / Refresh All
Shift+F2	Insert New Comment
F7	Spelling check
Alt+F8 / Alt+F11	To View Macros / To Open Microsoft Visual Basic Windows

MS PowerPoint

- It stands for Microsoft PowerPoint. (माइक्रोसफ्ट पावरप्वाइन्टको छोटो रूप।)
- Microsoft PowerPoint is Slide Show-Presentation software. It is developed by Microsoft and is part of Microsoft Office Suite. (स्लाइड सो प्रस्तुति सफ्टवेयर।)
- PowerPoint makes it easy to create and present your ideas in dynamic and visually attractive ways using multimedia. (मल्टिमिडिया प्रयोग गरी गतिशील र आकर्षक प्रस्तुति बनाउन सजिलो बनाउँछ।)
- **File Name:** Presentation (प्रेजेन्टेसन)
- **File type (Extension):** .pptx (new) | .ppt (old)
- **Run Command** for opening MS PowerPoint is: powerpnt.exe

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PowerPoint Important Shortcuts:

Shortcut key	Function
Ctrl+N	New Presentation
Ctrl+M	New slide (To insert new slide in current presentation)
F5	Slide Show (from beginning slide)
Shift+F5	Start presentation from current slide
Ctrl+Home / Ctrl+End	Bring directly to the first / last slide of presentation
Esc	Stop slide show

MS Access

- Microsoft Access is DBMS software. It is Relational DBMS. (रिलेसनल डाटाबेस व्यवस्थापन सफ्टवेयर।)
- It is developed by Microsoft and is part of Microsoft Office Suite.
- With Access, you can build a database without writing code or being a database expert.
- **File Name:** Database (डाटाबेस)
- **File type (Extension):** .accdb (new) | .mdb (old)
- **Run Command** for opening MS Access is: msaccess.exe
- **The major objects of MS Access are as follows:** Tables, Queries, Relationships, Macros, Forms, Reports, Module

३.२ एकीकृत शैक्षिक सूचना व्यवस्थापन प्रणाली (IEMIS)

IEMIS भनेको के हो? (What is IEMIS?)

- IEMIS stands for **Integrated Educational Management Information System**. (IEMIS भनेको एकीकृत शैक्षिक व्यवस्थापन सूचना प्रणाली हो।)
- यो विद्यालय स्तरको विद्युतीय एकीकृत शैक्षिक व्यवस्थापन सूचना प्रणाली हो।
- यो प्रणाली शिक्षा विभाग (Department of Education) द्वारा तयार गरिएको हो; अहिले नेपालका हरेक विद्यालयमा लागू छ।
- प्रत्येक विद्यालयका लागि छुट्टाछुट्टै **९ अङ्कको विद्यालय कोड** प्रयोग हुन्छ: २ अङ्कले जिल्ला कोड, ३ अङ्कले पालिका कोड र ४ अङ्कले विद्यालय कोड जनाउँछ।

IEMIS को सुरुवात (History of IEMIS)

- शिक्षा विभागलाई विद्यालयहरूको शैक्षिक तथ्याङ्क व्यवस्थित र सुधार गर्नुपर्ने आवश्यकताबाट यसको सुरुवात भयो।
- शैक्षिक सत्र २०६०/२०६१ देखि शिक्षा विभागले **Flash फारम** लागू गऱ्यो। सबै प्रकार र तहका विद्यालयले वर्षमा दुई पटक Flash-1 र Flash-2 फारम भरेर स्रोत केन्द्र र जिल्ला शिक्षा कार्यालय मार्फत माथिल्लो निकायमा reporting पठाउँथे।

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- पछि **Flash Report System (EMIS)** लाई परिमार्जन गरी **Excel based EMIS File** को विकास गरियो; त्यसलाई पुनः परिमार्जन गरेर **IEMIS** बनाइयो।
- २०७५ बाट यही IEMIS बाट परीक्षा व्यवस्थापनको कार्य र विपन्न लक्षित छात्रवृत्तिका लागि **PMT (Proxy Means Test – गरिबी मापन सूचाङ्क)** फारम भराउन सकिने व्यवस्था मिलाइयो।
- IEMIS file मा २०७८ देखि थपिएको नयाँ button **EIE** = Education in Emergency।

शब्द	पूरा रूप
IEMIS	Integrated Educational Management Information System
EMIS	Educational Management Information System
PMT	Proxy Means Test (गरिबी मापन सूचाङ्क)
EIE	Education in Emergency

३.३ शैक्षिक तथ्याङ्क सङ्कलन, विश्लेषण, सम्प्रेषण र प्रयोग

चरण	अर्थ	उदाहरण
सङ्कलन (Collection)	विद्यालयको विद्यार्थी, शिक्षक, भौतिक सुविधाको तथ्याङ्क जम्मा गर्ने	IEMIS/Flash फारम, उपस्थिति रजिस्टर
विश्लेषण (Analysis)	तथ्याङ्कलाई तालिका/प्रतिशत/औसतमा बदली अर्थ निकाल्ने	Excel को SUM, AVERAGE, chart
सम्प्रेषण (Communication)	नतिजा सम्बन्धित निकायलाई पठाउने/जानकारी दिने	Report, email, IEMIS reporting
प्रयोग (Use)	नीति, योजना, छात्रवृत्ति र शैक्षिक सुधारमा प्रयोग	विद्यालय सुधार योजना, PMT आधारित छात्रवृत्ति

अभ्यास प्रश्नहरू (Practice MCQs)

एकाइ A: कम्प्युटरको आधारभूत ज्ञान (प्रश्न १–४१)

1. "Computer" शब्द कुन भाषाको "Computare" बाट आएको हो?

(a) Greek (b) Latin (c) French (d) German

2. कम्प्युटरका पिता कसलाई भनिन्छ?

(a) Charles Babbage (b) John Von Neumann (c) Alan Turing (d) Vint Cerf

3. Computation क्षेत्रमा सबैभन्दा पहिले प्रयोग भएको device कुन हो?

(a) Pascaline (b) Slide Rule (c) Abacus (d) Napier's Bones

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4. कम्प्युटरको आधारभूत architecture कसले विकास गरे?

(a) Charles Babbage (b) John Von Neumann (c) Blaise Pascal (d) Herman Hollerith

5. पहिलो computer programmer कसलाई भनिन्छ?

(a) Lady Ada Lovelace (b) Grace Hopper (c) Tommy Flowers (d) Konrad Zuse

6. IPO cycle मा "P" ले के जनाउँछ?

(a) Print (b) Program (c) Process (d) Power

7. कम्प्युटरको दिमाग (Brain) कुन हो?

(a) Monitor (b) CPU (c) RAM (d) Hard disk

8. कुन चाहिँ CPU को भाग होइन?

(a) ALU (b) CU (c) Register (d) Printer

9. कम्प्युटरको सबैभन्दा छिटो memory कुन हो?

(a) RAM (b) ROM (c) Register (d) Hard disk

10. कुन Volatile memory हो?

(a) ROM (b) RAM (c) HDD (d) SSD

11. ROM मा राखिएको software लाई के भनिन्छ?

(a) Firmware (b) Freeware (c) Shareware (d) Malware

12. BIOS को पूरा रूप के हो?

(a) Basic Input Output System (b) Binary Input Output System

(c) Basic Internal Output System (d) Basic Input Operating System

13. कुन चाहिँ Softcopy output device हो?

(a) Printer (b) Plotter (c) Monitor (d) Scanner

14. कुन चाहिँ Input device होइन?

(a) Scanner (b) Joystick (c) Speaker (d) Light Pen

15. Operating System कुन प्रकारको software हो?

(a) Application (b) System (c) Programming (d) Tailored

16. Package software को उदाहरण कुन हो?

(a) Billing software (b) Microsoft Office (c) Compiler (d) Assembler

17. Tailored (Customized) software को उदाहरण कुन हो?

(a) MS Excel (b) Billing software (c) MS Paint (d) Notepad

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18. कुन चाहिँ Malware को उदाहरण हो?

(a) Virus (b) Device driver (c) BIOS (d) Web browser

19. Machine level language मा कुन अङ्कहरू मात्र हुन्छन्?

(a) 0 र 1 (b) 0 देखि 9 (c) A देखि Z (d) 1 देखि 8

20. Assembly language लाई machine language मा बदल्ने translator कुन हो?

(a) Compiler (b) Interpreter (c) Assembler (d) Editor

21. सम्पूर्ण program लाई एकैपटक अनुवाद गर्ने translator कुन हो?

(a) Compiler (b) Interpreter (c) Assembler (d) Debugger

22. कुन चाहिँ High Level Language होइन?

(a) C++ (b) Java (c) Assembly (d) JavaScript

23. GIGO को अर्थ के हो?

(a) Garbage In Garbage Out (b) Good In Good Out (c) Go In Go Out (d) Graphics In Graphics Out

24. कुन चाहिँ कम्प्युटरको सीमा (limitation) होइन?

(a) Lack of common sense (b) Lack of decision making

(c) Versatility (d) Risk of virus

25. 4096 megabytes बराबर कति हुन्छ?

(a) 40 GB (b) 4 GB (c) 0.4 TB (d) 4 Byte

26. 1 nanosecond बराबर कति हुन्छ?

(a) 10^{-3} सेकेन्ड (b) 10^{-6} सेकेन्ड (c) 10^{-9} सेकेन्ड (d) 10^{-12} सेकेन्ड

27. Digital computer ले कुन किसिमको data मा काम गर्छ?

(a) Continuous (b) Discrete (c) दुवै (d) कुनै पनि होइन

28. Analog computer कुन उद्देश्यको computer हो?

(a) General purpose (b) Special purpose (c) Entertainment only (d) Office only

29. सबैभन्दा ठूलो र शक्तिशाली computer कुन हो?

(a) Mainframe (b) Mini (c) Micro (d) Super

30. Micro computer मा कुन प्रयोग गरिन्छ?

(a) Vacuum tube (b) Microprocessor (c) Transistor (d) Punch card

31. पहिलो पुस्ताको मुख्य component कुन हो?

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(a) Transistor (b) IC (c) Vacuum tube (d) Microprocessor

32. Transistor कुन पुस्ताको मुख्य component हो?

(a) पहिलो (b) दोस्रो (c) तेस्रो (d) चौथो

33. तेस्रो पुस्ताको मुख्य component कुन हो?

(a) Vacuum tube (b) Transistor (c) IC (d) AI

34. Microprocessor (VLSI) कुन पुस्ताको component हो?

(a) दोस्रो (b) तेस्रो (c) चौथो (d) पाँचौं

35. पाँचौं पुस्ता कुन प्रविधिमा आधारित छ?

(a) Vacuum tube (b) Artificial Intelligence (c) Transistor (d) IC

36. Pascaline (पहिलो mechanical calculator) का आविष्कारक को हुन्?

(a) Blaise Pascal (b) John Napier (c) William Oughtred (d) Joseph Jacquard

37. Analytical Engine कसले डिजाइन गरे?

(a) Charles Babbage (b) Herman Hollerith (c) Konrad Zuse (d) Alan Turing

38. Herman Hollerith ले स्थापना गरेको कम्पनी पछि कुन बन्यो?

(a) Microsoft (b) IBM (c) Apple (d) Intel

39. ENIAC कसले निर्माण गरेका हुन्?

(a) Mauchly र Eckert (b) Atanasoff र Berry (c) Tommy Flowers (d) Konrad Zuse

40. नेपालमा आएको पहिलो computer कुन हो?

(a) ICL 2950/10 (b) IBM 1401 (c) Facit Calculator (d) UNIVAC

41. NCC (National Computer Center) कुन सालमा स्थापना भयो?

(a) वि.सं. २०१८ (b) वि.सं. २०२८ (c) वि.सं. २०३१ (d) वि.सं. २०३८

एकाइ B: इन्टरनेट (प्रश्न ४२–५८)

42. LAN ले कति क्षेत्र ओगट्छ?

(a) एउटै भवन भित्र (b) एउटै सहर (c) विश्वभर (d) एउटा देश

43. WAN को उदाहरण कुन हो?

(a) Home Wi-Fi (b) Internet (c) Intranet (d) कुनै पनि होइन

44. MAN ले कुन क्षेत्र ओगट्छ?

(a) एउटा कोठा (b) एउटै सहर (c) विश्वभर (d) एउटै भवन

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45. संस्था भित्रको मात्र private, internal network लाई के भनिन्छ?

(a) Internet (b) Extranet (c) Intranet (d) WAN

46. संस्थासँग partner, vendor, supplier र customer जोड्ने private network कुन हो?

(a) Extranet (b) Intranet (c) LAN (d) MAN

47. पहिलो computer network कुन मानिन्छ?

(a) Ethernet (b) ARPANET (c) Intranet (d) WWW

48. Internet का पिता कसलाई भनिन्छ?

(a) Tim Berners-Lee (b) Vint Cerf (c) Ray Tomlinson (d) Charles Babbage

49. WWW (World Wide Web) को सुरुवात कसले गरे?

(a) Tim Berners-Lee (b) Vint Cerf (c) Bill Gates (d) Ray Tomlinson

50. Email का पिता कसलाई भनिन्छ?

(a) Raymond Samuel Tomlinson (b) Vint Cerf

(c) Charles Babbage (d) Tim Berners-Lee

51. इन्टरनेटको आधिकारिक जन्मदिन (ARPANET मा TCP/IP प्रयोग) कहिले मानिन्छ?

(a) जनवरी १, १९६९ (b) जनवरी १, १९८३ (c) जनवरी १, १९९० (d) जनवरी १, १९९४

52. नेपालमा पहिलो commercial e-mail सेवा सुरु गर्ने ISP कुन हो?

(a) Subisu (b) Vianet (c) Mercantile (d) World Link

53. नेपालमा Fiber optic internet सुरु गर्ने कम्पनी कुन हो?

(a) Vianet (b) Subisu (c) World Link (d) Mercantile

54. Internet लाई अर्को नाममा के भनिन्छ?

(a) Information Superhighway (b) Intranet (c) Extranet (d) Hybrid net

55. Protocol भनेको के हो?

(a) Hardware (b) नियम तथा निर्देशनको सेट (c) Software (d) Web browser

56. Web Browser को प्रयोग केका लागि हुन्छ?

(a) WWW access गर्न (b) Document बनाउन (c) Virus हटाउन (d) Data print गर्न

57. E-mail को पूरा रूप के हो?

(a) Electronic Mail (b) Easy Mail (c) Express Mail (d) Emergency Mail

58. कुन चाहिँ Internet को सेवा होइन?

(a) Email (b) Video Conference (c) E-commerce (d) Compiler

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एकाइ C: शिक्षण सिकाइमा ICT (प्रश्न ५९–६९)

59. ICT को पूरा रूप के हो?

(a) Information and Communication Technology

(b) Information and Controlling Technology

(c) Internal Communication Technology

(d) माथिका कुनै होइन

60. कुन चाहिँ Multimedia को component होइन?

(a) Text (b) Animation (c) Graphics (d) Printer

61. Text, graphics, sound, animation र video को संयोजनलाई के भनिन्छ?

(a) Hypermedia (b) Multimedia (c) Visual Media (d) None

62. e-library को पूरा रूप के हो?

(a) Empty Library (b) Emergency Library (c) Electronic Library (d) English Library

63. शिक्षामा ICT को महत्वलाई कुनले सङ्केत गर्छ?

(a) सञ्चार बढाउँछ (b) सिकाइप्रति रुचि बढाउँछ (c) रचनात्मकता बढाउँछ (d) माथिका सबै

64. नेपालको निःशुल्क र खुला शैक्षिक digital पुस्तकालय कुन हो?

(a) E-Pustakalaya (b) Zoom (c) Excel (d) IEMIS

65. कुन चाहिँ Online learning platform होइन?

(a) Coursera (b) Udemy (c) Moodle (d) Notepad

66. Asynchronous online learning भनेको के हो?

(a) एकै समयमा live सिकाइ (b) शिक्षक र विद्यार्थी एकै समयमा नहुने सिकाइ

(c) केवल offline सिकाइ (d) कुनै होइन

67. VR को पूरा रूप के हो?

(a) Virtual Reality (b) Visual Record (c) Video Resolution (d) Voice Recognition

68. Educational software को उद्देश्य के हो?

(a) मनोरञ्जन मात्र (b) शिक्षालाई प्रभावकारी बनाउन (c) Game खेल्न (d) Virus फैलाउन

69. कुन चाहिँ नेपाली online learning platform हो?

(a) Coursera (b) Kullabs (c) Udemy (d) edX

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एकाइ D: साधारण सफ्टवेयर र Office Package (प्रश्न ७०–९७)

70. Notepad को default file extension कुन हो?

(a) .rtf (b) .png (c) .txt (d) .docx

71. WordPad को default file extension कुन हो?

(a) .txt (b) .rtf (c) .doc (d) .bmp

72. MS Paint कुन प्रकारको software हो?

(a) Word processing (b) Presentation (c) Electronic spreadsheet (d) Graphics

73. कुन Microsoft Office को version होइन?

(a) Office XP (b) Office 2007 (c) Office 2010 (d) Office 2009

74. कुन चाहिँ Spreadsheet program हो?

(a) Word (b) Excel (c) PowerPoint (d) Access

75. MS Word खोल्ने run command कुन हो?

(a) winword (b) openword (c) runword (d) wordpad

76. MS Word को file extension कुन हो?

(a) .doc (b) .docx (c) .doc र .docx दुवै (d) .dot मात्र

77. Ctrl+A को प्रयोग केका लागि हुन्छ?

(a) अक्षर A ठूलो बनाउन (b) सबै select गर्न (c) अक्षर A खोज्न (d) कुनै होइन

78. MS Word मा अधिकतम font size कति हुन्छ?

(a) 72 (b) 16384 (c) 1638 (d) 256

79. Excel file लाई के भनिन्छ? (a) Document (b) Workbook (c) Presentation (d) Database

80. Excel मा सबै formula केबाट सुरु हुन्छ?

(a) " (b) = (c) @ (d) ?

81. कुन चाहिँ Excel को function होइन?

(a) SUM (b) MAX (c) AVG (d) MIN

82. Excel मा Cell भनेको के हो?

(a) Row र Column को प्रतिच्छेदन (b) दुई Row बीचको ठाउँ

(c) दुई Column बीचको ठाउँ (d) Sheet को नाम

83. Excel 2007 र पछिको version मा कति columns हुन्छन्?

(a) 256 (b) 16,384 (c) 65,536 (d) 1,048,576

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84. Excel 2007 र पछिको version मा कति rows हुन्छन्?

(a) 65,536 (b) 256 (c) 1,048,576 (d) 16,384

85. Excel मा Save As dialog box को shortcut कुन हो?

(a) F2 (b) F12 (c) F5 (d) F7

86. Excel मा cell edit गर्ने shortcut कुन हो?

(a) F2 (b) F4 (c) F5 (d) F12

87. Excel मा AutoSum को shortcut कुन हो?

(a) Ctrl+S (b) Alt+= (c) Ctrl+= (d) F9

88. PowerPoint को file extension कुन हो?

(a) .ppt (b) .pptx (c) .ppoint (d) .ppt र .pptx दुवै

89. PowerPoint मा बनेको file लाई के भनिन्छ?

(a) Document (b) Workbook (c) Presentation (d) Database

90. हालको slide बाट slide show सुरु गर्ने shortcut कुन हो?

(a) F5 (b) F6 (c) Shift+F5 (d) Ctrl+F5

91. PowerPoint मा नयाँ slide थप्ने shortcut कुन हो?

(a) Ctrl+N (b) Ctrl+M (c) Ctrl+S (d) Ctrl+Enter

92. MS Access के हो?

(a) Word processor (b) Presentation program (c) Spreadsheet (d) Database management software

93. MS Access को file extension कुन हो?

(a) .mdb (b) .accdb (c) .xlsx (d) .mdb र .accdb दुवै

94. कुन चाहिँ MS Access को object होइन?

(a) Tables (b) Queries (c) Forms (d) Slides

95. MS Word मा document print गर्ने shortcut कुन हो?

(a) Ctrl+P (b) Ctrl+Shift+P (c) Alt+P (d) F5

96. MS Word मा spelling check को shortcut कुन हो?

(a) F7 (b) F5 (c) F9 (d) F12

97. MS Outlook के हो?

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(a) Email program (b) Database program (c) Presentation program (d) Spreadsheet program

एकाइ E: IEMIS (प्रश्न ९८–१०६)

98. IEMIS को पूरा रूप के हो?

(a) Integrated Educational Management Information System

(b) Internal Educational Management Information System

(c) Integrated Educational Manageable Information System

(d) Intelligent Educational Management Information System

99. विद्यालय स्तरीय एकीकृत शैक्षिक व्यवस्थापन सूचना प्रणाली कुन हो?

(a) Excel (b) E-Pustakalaya (c) Zoom (d) IEMIS

100. IEMIS कुन निकायद्वारा तयार गरिएको हो?

(a) शिक्षा विभाग (b) नेपाल टेलिकम (c) नेपाल राष्ट्र बैंक (d) त्रिभुवन विश्वविद्यालय

101. IEMIS मा प्रत्येक विद्यालयको कोड कति अङ्कको हुन्छ?

(a) 6 (b) 9 (c) 7 (d) 12

102. Flash फारम वर्षमा कति पटक भरिन्थ्यो?

(a) 1 (b) 2 (c) 3 (d) 4

103. PMT को पूरा रूप के हो?

(a) Proxy Means Test (b) Primary Mean Test (c) Public Management Tool (d) Program Monitoring Test

104. IEMIS file मा २०७८ देखि थपिएको नयाँ button EIE को पूरा रूप के हो?

(a) Emergency in Education (b) Electronic in Engineering (c) Education in English (d) Education in Emergency

105. IEMIS बाट PMT फारम भराउने व्यवस्था कुन सालदेखि भयो?

(a) २०६० (b) २०७५ (c) २०७८ (d) २०८०

106. Flash फारम कुन शैक्षिक सत्रदेखि लागू गरिएको थियो?

(a) २०६०/६१ (b) २०७०/७१ (c) २०७५/७६ (d) २०७८/७९

उत्तर कुञ्जी (Answer Key)

Qn	उत्तर	Qn	उत्तर	Qn	उत्तर	Qn	उत्तर	Qn	उत्तर
1	b	23	a	45	c	67	a	89	c

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Qn	उत्तर	Qn	उत्तर	Qn	उत्तर	Qn	उत्तर	Qn	उत्तर
2	a	24	c	46	a	68	b	90	c
3	c	25	b	47	b	69	b	91	b
4	b	26	c	48	b	70	c	92	d
5	a	27	b	49	a	71	b	93	d
6	c	28	b	50	a	72	d	94	d
7	b	29	d	51	b	73	d	95	a
8	d	30	b	52	c	74	b	96	a
9	c	31	c	53	a	75	a	97	a
10	b	32	b	54	a	76	c	98	a
11	a	33	c	55	b	77	b	99	d
12	a	34	c	56	a	78	c	100	a
13	c	35	b	57	a	79	b	101	b
14	c	36	a	58	d	80	b	102	b
15	b	37	a	59	a	81	c	103	a
16	b	38	b	60	d	82	a	104	d
17	b	39	a	61	b	83	b	105	b
18	a	40	b	62	c	84	c	106	a
19	a	41	c	63	d	85	b		
20	c	42	a	64	a	86	a		
21	a	43	b	65	d	87	b		

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शुभकामना! (Best of Luck)