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REGIONAL RURAL BANKS

Volume – 4

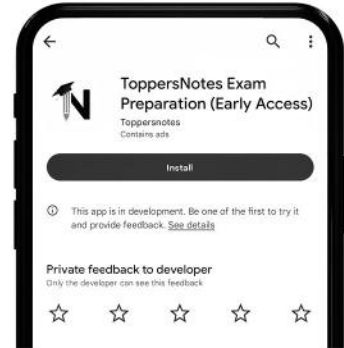## Banking Awareness and Computer

IBPS – RRB

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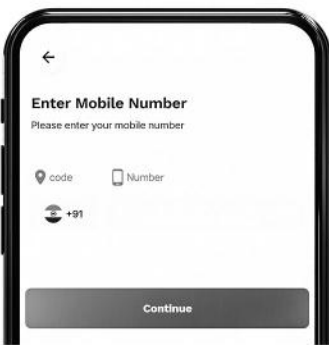To use the QR codes in the book, Please follow the below steps :-

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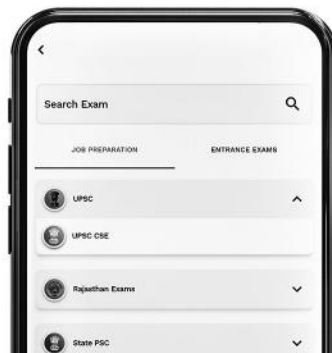
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BANKING AWARENESS

HISTORY OF BANKS

- The first bank established in India was Bank of Hindustan in 1770.

  - It was established in Kolkata.
  - It was established under European management.

- Central Bank of India was established in 1911. And it is the first Indian bank which was wholly owned and managed by Indians.

  - It is called the first truly Swadeshi Bank.

- Allahabad Bank, established in 1865, is the oldest Joint Stock Bank in India today.

- The first Indian Bank in the world was Bank of Venice, Italy, in 1157.

- 1806 – Bank of Calcutta (established)

  ↓ (RENAMED)

  1809 – Bank of Bengal

  1840 – Bank of Bombay

  1843 – Bank of Madras

  In 1921, the three Banks, Bank of Bengal Bank of Bombay, and Bank of Madras

were merged with each other and named as the Imperial Bank of India.

The three banks, Bank of Bengal, Bank of Bombay, and Bank of Madras, were Presidency Banks in India.

- Imperial Bank of India was renamed in 1955 as the State Bank of India.

- On 19th July 1969, 14 Banks were nationalised in India.

→ Central Bank of India (1911, Mumbai)
→ Bank of India (1906, Mumbai)
→ Punjab National Bank (1894, New Delhi)
→ Bank of Baroda (1908, Gujarat)
→ United Commercial Bank (1943, Kolkata)
→ Canara Bank (1906, Bengaluru)
→ Dena Bank (1938, Mumbai)
→ United Bank of India (1950, Kolkata)
→ Syndicate Bank (1925, Karnataka)
→ Allahabad Bank (1865, Kolkata)
→ Indian Bank (1907, Chennai)
→ Bank of Maharashtra (1935, Pune)
→ Indian Overseas Bank (1937, Chennai)
→ Union Bank of India (1919, Mumbai)

- In 1980, six more banks were nationalised in India.

→ Andhra Bank (1923, Hyderabad)

→ Corporation Bank (1906, Mangalore)
→ New Bank of India (1936, New Delhi)
→ Oriented Bank of Commerce (1943, Gurgaon)
→ Punjab and Sindh Bank (1906, New Delhi)
→ Vijaya Bank (1931, Bengaluru)

NOTE→ In 1993, New Bank of India was acquired by Punjab National Bank.

Therefore, total no. of nationalised bank increased to 19.

• General Bank of India is the 2nd bank in India that was established in 1786. It was closed in 1791.

• Central Bank of India is the first Public Sector Bank in India to introduce CREDIT CARD.

→• ATM was first introduced in India in 1987 in Mumbai by HSBC Bank.

• Cheque System was first introduced by Bengal Bank in 1784.

• Saving Account System was first introduced in 1833 by Presidency Bank.

• ICICI Bank is the first Indian bank to provide Internet Banking facility.

- In 1955, State Bank of India was nationalised under the SBI Act, 1955.

→ Seven subsidiaries of SBI were nationalised in 1959.

SEVEN SUBSIDIARIES AND THEIR MERGING :→

1. State Bank of Patiala (1917)
2. State Bank of Hyderabad (1941)
3. State Bank of Travancore
4. State Bank of Bikaner & Jaipur (1963)
5. State Bank of Mysore (1913)
6. State Bank of Saurashtra
7. State Bank of Indore

NOTE → In 2008 State Bank of Saurashtra and in 2010 State Bank of Indore are merged with SBI.

→ Therefore in present there are total 5 subsidiary of SBI.

→ Mumbai is the headquarter of SBI.

→ In 2013 Arundhati Bhattacharya became the first woman Chairperson of SBI.

→ SBI has largest number of mobile application user.

Practice Questions

Q.1 Which among the following are the correct locations of three presidency Banks during British India

(1) Calcutta, Bombay, Madras   (2) Surat, Calcutta, Madras

3) Surat, Madras, Bombay   (4) Bombay, Calcutta, Surat

(5) None of these   Ans. (1)

Q.2 Which of the following is the oldest joint stock bank of India?

(1) Bank of India   (2) Bank of Baroda

(3) Punjab National Bank   (4) Allahabad Bank

(5) State Bank of India   Ans. (4)

Q.3 In which of the following bank is the commercial bank?

(1) ICICI   (2) SBI   (3) IDBI

(4) HSBC   (5) All of these   Ans. (5)

Q.4 First Nationalization of commercial banks was on-

(1) 19th July 1969   (2) 15th April 1980   (3) 14th July 1980

(4) 2nd October 1975   (5) 1st April 1991   Ans. (1)

Q.5 Which of the following public sector banks has the largest number of branches in foreign countries?

(1) Bank of India   (2) Bank of Baroda   (3) Punjab National Bank

(4) Corporation Bank   (5) State Bank of India   Ans. (5)

Q.6 In respect of the commercial banks Non Performing Assets are ...

(1) Bank Deposit which are not used in any type of investment

(2) Capital funds which are used in investment

(3) Loan which has lowest interest

(4) Loan which is not recovers interest and principal amount of loan on correct time

(5) Loan which are recover interest and principal amount of loan on correct time   ans.(4)

Q.7 Match the list I to list II and choose the correct option from the following

(1) SBI   I. 1982

(2) RRB   2. 1955

(3) SIDBI   3. 1990

(4) IFCI   4. 1975

(5) NABARD   5. 1948

(1) 1 2 3 4 5   (2) 2 4 3 1 5   (3) 2 4 3 5 1   (4) 4 2 3 5 1   (5) 1 3 2 4

Ans(3)

Q.8 In which of the following year lead bank scheme was started?

(A) 1969   (B) 1980   (C) 1991   (D) 1975   (E) 1949

Ans(1)

Q.9 In which year, Government of India nationalised 14 major banks whose national deposits were more than 50 crores.

A. 1947   B. 1955   C. 1966   D. 1969   E. 1959

Ans.(69)

Q.10 In which year, Regional Rural Banks started working in India?

(A)1970   (B)1975

(C)1978   (D)1981   Ans. (B)

Q.11 Original headquarters of RBI were located at ___?

(A)Calcutta   (B)Bombay

(C)Madras   (D)New Delhi   Ans. A

Q. 12 Which among the following was the first bank to open a branch on foreign soil?

(A)Bank of India   (B)State Bank of India

(C)Bank of Punjab   (D)Allahabad   Ans.(A)

Q. 13 Which among the following are the correct locations of three presidency banks during British India?

(A)Calcutta, Madras, Bombay   (B)Surat, Calcutta, Madras

(C)Surat, Madras, Bombay   (D)Bombay, Calcutta,   Ans.(A)

Q. 14 In which year, the nationalization of subsidiary banks of the State Bank of India (SBI) was done?

(A) 1955   (B) 1956   (C) 1959   (D) 1980   Ans(C)

Q. 15 What was the name of State Bank of India (SBI) before it was created by SBI Act?

(A)Imperial Bank of Hindustan   (B)Imperial Bank of Bengal

(C)Imperial Bank of Madras   (D)Imperial Bank of India
Ans(D)

Q. 16 The liberalisation of Indian banking and regulation was done first on the basis of recommendations of which committee

(A)Narasimham Committee   (B)A Ashok Committee

(C)Saraiya Committee   (D)Khusro Committee   Ans.(A)

Q. 17 In which year, the first bank of India "Bank of Hindustan" was established?

(A)1870   (B)1770   (C)1795   (D)1880   Ans.(B)

COMPUTER

Introduction to Computer

- Computer is a fast Working electronic machine, which accepts the input information and data in electronic form and processes it according to pre-stored instructions, provides desired output.
- It is also called computer in Hindi.
- The word 'computer' is derived from the word 'compute', which means 'to calculate'.
- Abacus - In ancient times, the device that taught counting was called Abacus.
- John Napier developed the logarithm.

Machine Development

- The Pascal calculator was the first machine calculator, invented by Blaise Pascal (Mathematician from France).

- **ENIAC -** Electronic Numerical Integrator and Computer) It is also called the first digital computer.
- Charles Babbage is called the creator or father of the modern computer.

Generations of Computers

First Generation (1942-55)

- In this vacuum tubes or vacuum valves were
Used.

- The first stored program computer was developed by Morris Wilkies (England) in the form of EdSec.

Generations	Hardware/Technology	Memory Device	Programming Language	Examples
I (1942-55)	Vacuum Tube	Magnetic Disks, Input, Output Pentacards	Machine Language/ Binary Language	ENIAC, UNIVAC
II (1955-64)	Transistor	Magnetic Core, Magnetic Tape	Assembly Language, High Level Language (COBOL & FORTRAN)	IBM – 2000 CDC – 360
III (1965-70)	IC (Integrated Circuit)	Magnetic Core (Floppy Disk)	Compiler Language (1972-'C' Language)	IBM – 320
IV (1971-85)	VLSI – Very Large Scale Integration SSI – Small Scale Integration LSI – Large Scale Integration Micro prossessor, Use of Micro Computer	CD (Compact Disk)	IV Generation Language	IMAC (Siddarth)
V (1985, till now)	ULSI (Ultra Large Scale Integration (Artificial intelligence)	DVD/PD/Memory Card / BRD	Natural Language	Laptop/ Tablet

Second Generation (1955-64)

- In 1947, William "Cockley" of Bell Laboratory (USA) developed 'Transistor' (PNP or NPN semiconductor device).
- In this generation computers, input and output devices were more convenient.
- To avoid the complexity of the first generation developed machine and assembly language, simple computer language i.e. high level language was developed in the second generation.
- Computers became smaller and cheaper in size with the use of transistors instead of vacuum tubes.
- Computer languages like FORTRAN, COBOL etc. developed.

Third Generation (1965-70)

- Developments in electronic technology made it possible to make a small silicon chip.
- This new technology is called Integrated Circuit or Integrated Circuit.
- With this generation of computers, external devices for storing data such as discs, tapes, etc. were developed.
- ICL 2903, ICL 1900, UNIVAC 1108 and System 1360 were prominent among the computers of this generation.

Fourth Generation (1971-1985)

- ICs were further developed in this generation, which are called massive integrated circuits.
- With this invention, the entire central processing unit came in a small chip, which is called a microprocessor.

- ALTAIR 8800 was the first microcomputer, which was made by a company called MITS.
- With the arrival of the fourth generation, the size of the computer became very small and the memory increased a lot.

Fifth Generation (1985, till now)

- In this the use of Ultra Large Scale IC (ULSIC) started, in which circuits equivalent to millions of transistors were made on a small chip.
- ULSIC (Ultra Large Scale Integrated Circuit) was created by upgrading the VLSIC chip in the internal electronic circuit of the computer, due to which the size of the microcomputer is getting smaller day by day.
- Today computers are available in different models desktop, laptop, palmtop etc.
- Internet, multimedia developed in this generation.
- Development of new application, artificial intelligence has made great progress in this area.

Classification of Computer

Classifications of Computer	
Based on Technology	**Based on Efficiency and Capacity**
(i) Digital Computer	(i) Mainframe computer
(ii) Analog computer	(ii) Mini computer
(iii) Hybrid	(iii) Micro Computer
(iv) Optical Computer	(iv) Super computer.

Based on Technology

2. **Digital/Numerical Computer**
   - In these computers, information and data are represented in a discrete form as a fixed number 0 or 1.
   - This computer expresses each action or activity in 'Yes' (i.e., 1) and 'No' (i.e., 0) and acts accordingly.
   - Binary digital system is used in digital machines.
3. **Analog Computer**
- Those computers in which various physical quantities such as pressure, temperature, length etc. keep changing continuously.
- These computers measure an amount on the basis of mutual comparison.
4. **Hybrid Computer**
   - Both analog and digital computers are used in hybrid computers.
   - While calculating, some parts are calculated on analog computer and some on digital computer.

5. **Optical Computer**
   - The computing devices in these are made based on the optical method.
   - A medium such as a wire is not required for the conduction of light.

Based on Efficiency and Capacity

1. **Mainframe Computer**
   - It was as huge as the size of a room.
   - Its specialty was that more than 100 people can work together in this computer.
2. **Mini Computer**
   - Minicomputers are cheaper, less powerful and of medium size as compared to mainframe computers.
   - They are often used in laboratories and commercial organizations.
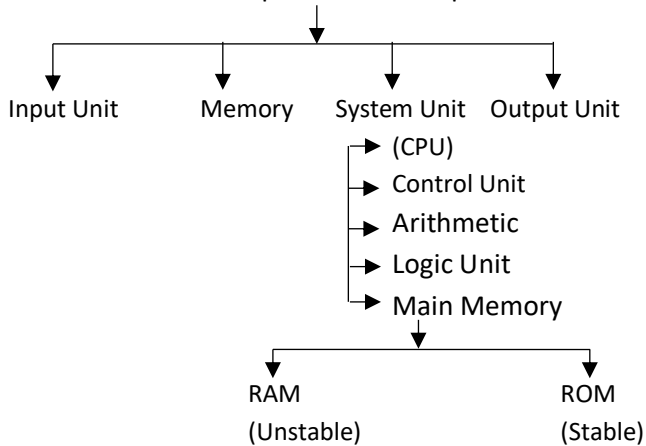3. **Micro Computer**
   - These are small computers.
   - They are cheap in price and small in size, so they can be taken home or outside for personal use, they are also called personal computers or PCs
4. **Super Computer**
   - It is very powerful, dynamic and its memory capacity is also very high.
   - The working capacity of super computer is more than 500 megaflops.
   - They are used in weather forecasting, scientific and space related research, molecular modulating, physical simulation, military agencies, etc.
   - Multiple CPUs work in parallel order in a super computer.
   - The world's first supercomputer research company had created 'CRAY K.I.S' in the year 1979.

Computer Working System, Input, Output and Storage

Main Components of Computer

Input Unit   Memory   System Unit   Output Unit
→ (CPU)
→ Control Unit
→ Arithmetic
→ Logic Unit
→ Main Memory

RAM (Unstable)   ROM (Stable)

1. **Input Unit**
   - It is the unit of the computer that receives input in the form of data and commands.

2. **Storage**
   - This unit is used to store the processed data temporarily and the provided output permanently.

   Input Unit $\rightarrow$ Processing Unit $\rightarrow$ Output Unit
   $\downarrow$ $\uparrow$
   (Data + Instruction) Memory Unit (Information)

Memory can be divided into two parts -

(i) Primary or Main Memory

(ii) Secondary or Auxiliary Memory

3. **System Unit**
   - Its function is to process the given data and extract information from it in the form of output, it is also called CPU (Central Processing Unit).
   - It is also called the brain or heart of the computer.
   - It is mainly divided into two parts -

(i) A.L.U (Arithmetic and Logic Unit)
   - All the arithmetic and logical calculations occurring in a computer are done by this unit.
   - ALU Contral Unit - Can calculate on any data according to the instructions given by it.
   - Logical calculations are meant for addition, subtraction, multiplication, division, etc.

Note – AND, OR, NOT etc. are called Boolean operators, which are used to perform logical calculations.

(ii) CU - Control Unit
   - All types of activities happening in a computer are controlled by this unit.
   - The control unit provides a variety of instructions to the ALU to perform calculations.

   - The control unit also performs the task of bringing the processed data in the main memory to the processor.

Storage Unit

- The word to be processed in the computer is 0 or 1 as a binary digit, is denoted.
- Binary digit 0 or 1 is defined by bit (binary digit) or letter or character.
- A word in a computer is made up of 8 bits, which is called a byte.
- The smallest unit of memory in a computer is a bit (bit).

  4 Bit = 1 Nibble

  8 Bit = 1 Byte

  $2^{10} - 1024 \, Byte = 1 \, KB \, (Kilo \, byte) = 1000$
  $2^{20} - 1024 \, KB = 1 MB (Mega \, byte) = 1000^2$
  $2^{30} - 1024 \, MB = 1 GB (Giga \, byte) = 1000^3$
  $2^{40} - 1024 \, GB = 1 \, TB \, (Tera \, byte) = 1000^4$
  $2^{50} - 1024 \, TB = 1 \, PB \, (Penta \, byte) = 1000^5$
  $2^{60} - 1024 \, PB = 1 \, EB \, (Exa \, byte) = 1000^6$
  $2^{70} - 1024 \, EB = 1 ZB \, (Zetta \, byte) = 1000^7$
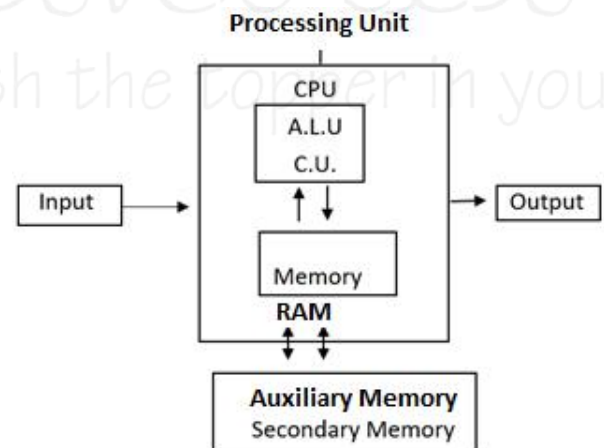 $2^{80} - 1024 \, ZB = 1 YB \, (yotta \, byte) = 1000^8$

Ascending Order -

Bit < Byte < KGB < MB < GB < TB < EB < ZB < YB

$1024 \, KB = 2^{23} Bit$
$= 1024 \times 1024 \times 8$
$= 2^{10} \times 2^{10} \times 2^3$
$= 2^{23}$

Processing Unit

- Processor has Resistor and System Clock in addition to ALU and CU.
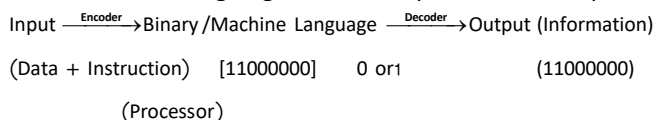
4. **Output Unit**
   - The user receives the processed results through the output itself.
   - Examples of some output devices are monitors, printers, speakers, pen drives, etc.

Input and Output Devices

Input Device

- Input devices are used to input data, instructions, information etc. into the computer.
- Input devices also work to encode data, with the help of which the data can be processed in the computer.

Note - The data going into the computer is called input.

Input $\xrightarrow{\text{Encoder}}$ Binary /Machine Language $\xrightarrow{\text{Decoder}}$ Output (Information)

(Data + Instruction) [11000000] 0 or 1 (11000000)

(Processor)

Input devices are:-

1. **Key Board (101 – 108) / QWERTY**
   - These are the most popular input devices for inputting into the computer.
   - With the help of key-board, data and instructions can be entered in the computer.
   - Keyboard is an input device based on typewriter.
   - Keyboard is a device acting like an encoder, which works to convert the input data into 0 or 1 binary digit.
   - By pressing and holding a key on the keyboard for 0.5 seconds, the letter of the key is input evenly, this process is called typomatic.
   - **Different types of keys -**

(i) Numeric Keys (0 से 9) = To input the numbers.

(ii) Alpha Keys (A से Z) = To input the alphabets.

(iii) Function Keys $[F_1$ से $F_{12}]$ = Total = 12

   F_1 = Help
   F_2 = Rename
   F_3 = Search
   F_4 = Redo
   F_5 = Refresh/Slide Show
   F_6 = To move the cursor to the address bar in an Internet browser.
   F_7 = For grammar and spelling errors.
   F_{12} = Save as

(iv) Toggle Key – The key having (On) and Off (Off) features in the keyboard is called (Toggle Key).
   (a) Num Lock – This key is used to use the arrow key present on the numeric pad.
   (b) Caps Lock – This key is used to input capital letters.
   (c) Scroll Lock – With the help of this key, moving forward and backward in the document is stopped at a particular place.

(v) Modifier Key/Combination Key -
   (a) Alt (Alter)- 2
   (b) Ctrl (Control) -2
   (c) Shift (Shift) – 2

(vi) Navigation Key
   (a) Arrow Key
   (b) Page up (To go to the first page)
   (c) Page down (To go to the next page)
   (d) Home (To go to the first page of the document)
   (e) End (To go to the last page of the document)
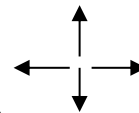
(vii) Special Character Key –[* # & $]

(viii) Special Key
   (a) Space bar – To leave space between the two words.
   (b) Tab Key – Pressing the Tab key in MS Word moves the cursor forward 0.5 inches.
   (c) Back Space – It is used to erase the letter from the left side.
   (d) Delete – To erase the letter from the right side is used.
   (e) Enter – With the help of this key, a new line or a new paragraph is started in a document.
   (f) Window – Pressing it activates the start button.

### Numeric Keypad Key-Board

- This is a set of 17 keys on the right side of the keyboard.
- The second row of the key board is called ASDFGHJKL Home Key.

2. **Pointing Device**
   - That input device in which a pointer, called a cursor, is used to provide data and instructions.

(i) **Mouse-**
   - Mouse is used to operate in the computer.
   - Mouse mainly consists of two or three buttons which are pressed to perform an action and this action is called click.
   - Mouse has various buttons.
     (a) Left button
     (b) Right button
     (c) 3 Scroll Key
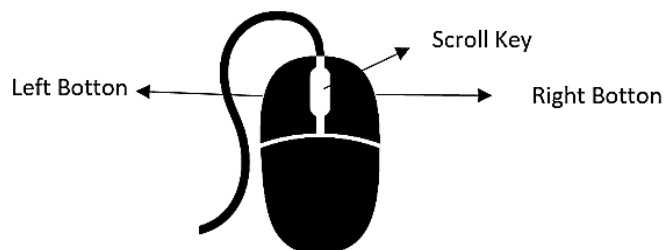
- On the basis of technology, the mouse is divided into 2 parts -
  1- Mechanical Mouse
  2- Optical Mouse

(ii) **Touchpad** - This pointing device is used in laptop instead of mouse.

(iii) Joystick - This device is used to move the pointer at a faster speed. It is mainly used for learning computer games.

(iv) Light Pan - This device is used for designing works, so it is used for CAD (Computer Added Design).

(v) Trackball - This device is mainly used where there is not much space available to move the cursor.

3. Scanner
- This device is used to convert a hard copy into a soft copy.
- Both text and graphics can be scanned with the help of Scanner.

4. Microphone/Mic/Speech Recognisation System
- This device is used to provide data in the form of voice to the computer.

5. Biometric Sensor
- This device is used to input traces of various biological parts of human beings in the computer.

6. BCR (Barcode Reader)
- This device is used to read the information stored in the bar code marked on an object.

7. OMR (Optical Mark Reader)
- This device is mainly used in the computer to check the multiple choice answer sheet of a candidate.

8. MICR (Magnetic Ink Character Reader/Recognisation)
- This device is used in the bank, with its help the numbers printed on a check with magnetic ink can be processed.
- MICR can read only ten digits and 4 special characters.
- MICR character can be read by both machine and human.

9. OCR (Optical Character Reader)
- This device is used to make the machine understandable by reading printed or handwritten letters on a question.
- OCR can read only one character at a time.

10. Smart Card Reader
- This device is used to read the information stored in the micro chip and magnetic chip in the smart card (Credit/Debit).

Output Devices
- This device is used to indicate the output provided by the computer.
- Output is provided by the output device in two forms.
  (i) Soft Copy
  (ii) Hard Copy

Note – The process of making the output provided by the processor understandable to the user is called decode.

The outputs are as follows -

1. Monitor / Screen/ Display / VDU (Visual Display Unit)
- The most popular output device in a computer, which is used to represent the data provided by the computer in the form of soft copy.
- It is of three types -
  (i) CRT – Cathode Ray Tube
  (ii) Flat Panel Display → LED
                            → LCD
  (iii) Plasma Display Monitor

2. Speaker
- This device is used to provide audio output.
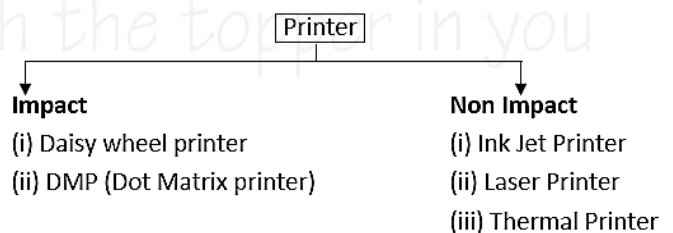
3. Projector
- This device is used to represent the multimedia file stored in the computer.

4. Plotter
- It is an output device working similar to a printer.
- Generally this output device is used for engineering works.

5. Printer
- This device is used to provide output in the form of hard copy.
- Printers are of two types on the basis of printing technology -

```
                    Printer
        ┌──────────────┴──────────────┐
      Impact                      Non Impact
(i) Daisy wheel printer      (i) Ink Jet Printer
(ii) DMP (Dot Matrix printer) (ii) Laser Printer
                             (iii) Thermal Printer
```

- Printer speed is measured in PPM (Page per minute).

Computer System

Binary, Decimal System ASCII Code and Unicode

- The following four number systems are used in the number system used in the computer.
- The most important of these systems is the binary number system.

1. Binary Number System

- In this number system, only two digits 0, 1 are used.
- When current flows in the computer's circuit i.e. the circuit is switched on, it is called signal '1' and if it is switched off then it is called signal '0'. Both these numbers are called binary digit or bit for short.
  Example -
  01101 - This is a 5 bit number.
  11010010 - This is a 8 bit number.

2. Octal Number System

- A total of 8 numbers from 0 to 7 are used in this.
- In this, the digits 8 and 9 are not used like the decimal system.
- Here the highest digit is 7.

3. Decimal Number System -

- In this number system 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 are the ten symbol values.
- Due to which the base of this number system is 10.
- The place values of the decimal system are as follows -
  Signal place value to the power of 10

(Symbolic Value)	(Positional)	(Value)
1.	Unit (1)	10^0
2.	Tens (10)	10^1
3.	Hundreds (100)	10^2
4.	Thousands(1000)	10^3
5.	Ten Thousand (10000)	10^4
6.	Hundred Thousand (100000)	10^5
7.	Million (1000000)	10^6

4. Hexa Decimal Number System

- In this, binary digits are converted into four binary groups.
- The hexa decimal system is a system with a base of 16.
  Examples - $(245A)_{16}$, $(698E)_{16}$ etc.

Computer Coding

- With its help, the data to be processed is defined as to how it will be displayed while storing it in the computer.

1. ASCII (American Standard Code for Information Interchange)

- In this type of coding, the decimal number is defined by its binary.
- It is of two types.
  (i) 7-Bit coding
  (ii) 8-bit coding

2. BCD (Binary Coded Decimal)

- In this type of coding, each digit of the decimal number is represented in 4 binary bits. It is 4 bit binary coding.

Example -

Decimal Number	4 Bit BCD Equivalent
0	0000
1	0001
2	0010
3	0011
4	0100

3. EBCDIC (Extended Binary Coded Decimal Interchange Code)

- In this type of coding, each digit of the decimal number is represented in 8 binary bits.
- It is an 8-bit BCD code.
- Hexa decimal numbers are used in this type of coding.

4. UNICODE (Universal Code)

- This type of coding is used to provide similar type of coding to symbols used in different languages of the world.
- It is of three types.
  (I) UTF-8
  (II) UTF-16
  (III) UTF-32
  (UTF - Uniform Transformation Formate)

Number Conversion

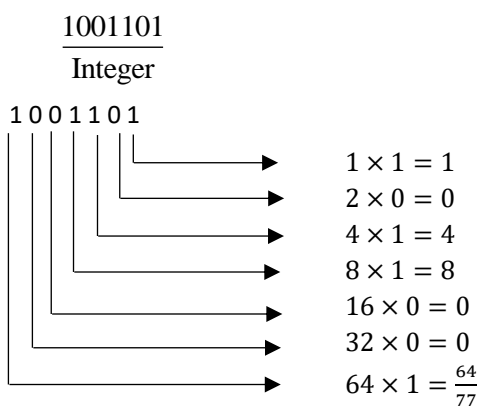### 1. Binary to Decimal Conversion

Converting from binary to decimal is obtained by multiplying each digit of the binary number by its place value.

For example, converting $(10101)_2$ to a decimal number.

$2^4 \ 2^3 \ 2^2 \ 2^1 \ 2^0$

$= 16 = 8 = 4 = 2 = 1$

$1 - 1 \times 1 = 1$

$0 - 2 \times 0 = 0$

$1 - 4 \times 1 = 4$

$0 - 8 \times 0 = 0$

$1 - 16 \times 1 = \dfrac{16}{21}$

Thus, the decimal form of the binary number $(10101)_2$ is $(21)_{10}$.

2. **Converting the Binary Number (1001101.0110)2 to a Decimal.**

$$\overline{1001101} \atop \text{Integer}$$

1 0 0 1 1 0 1

$1 \times 1 = 1$
$2 \times 0 = 0$
$4 \times 1 = 4$
$8 \times 1 = 8$
$16 \times 0 = 0$
$32 \times 0 = 0$
$64 \times 1 = \frac{64}{77}$

$$\frac{01101}{\text{Fraction}} = 0.01101$$

$0 \times 2^{-1} + 1 \times 2^{-2} + 1 \times 2^{-3} + 0 \times 2^{-4} + 1 \times 2^{-5}$
$= 0 + \frac{1}{2} + \frac{1}{8} + 0 + \frac{1}{32}$
$= 0 + .5 + .125 + .3125$
$= (.40625)_{10}$

Inclusively,
$= (77.40625)_{10} \Rightarrow (77)_{10}$

Decimal	Hexadecimal	Octal	Binary
0	0	0	0
1	1	1	1
2	2	2	10
3	3	3	11
4	4	4	100
5	5	5	101
6	6	6	110
7	7	7	111
8	8	10	1000
9	9	11	1001
10	A	12	1010
11	B	13	1011
12	C	14	1100
13	D	15	1101
14	E	16	1110
15	F	17	1111

3. **Convert from Decimal to Binary -**

Example - $(16)_{10}$

```
2 | 16
2 | 8    0  ↑
2 | 4    0  |
2 | 2    0  |
2 | 1    0  |
    | 0    1  |
```
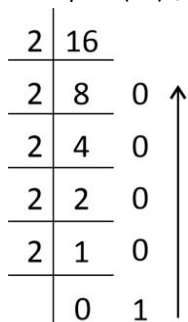
- In this system, the number written is divided by 2 and the "scores" are written separately.

$(16)_{10} \Rightarrow (1000)_2$

For example, converting decimal number 0.7824 to binary.

|			
$0.7824 \times 2 = 1.5648$	Integer	1
$1.5648 \times 2 = 1.1296$	Integer	1
$1.1296 \times 2 = 0.2592$	Integer	0
$0.2592 \times 2 = 0.5184$	Integer	0
$0.5184 \times 2 = 1.0368$	Integer	0
$1.0368 \times 2 = 0.736$	Integer	0
$0.736 \times 2 = 1.472$	Integer	1

Therefore, $(0.7824)_{10} = (0.1100101)_2$ (Approx.)

Equivalent Values in Decimal System and Binary System

Decimal	Binary
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000
9	1001
10	1010
16	10000
32	100000
64	1000000
100	1100100

Conversion table for values Decimal, Hexa Decimal, Octal and Binary

Computer Organization

Computer Hardware

Hardware

Electronic Devices | Magnetic Devices | Mechanical Devices
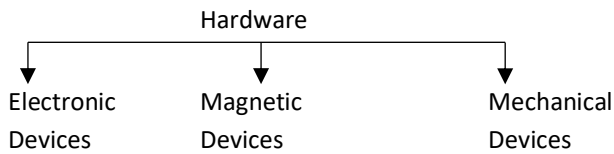
- **Input and output devices are the main hardware of the computer.**

Some of the hardware of personal computer are as follows
(i) Input Devices - Mouse, Keyboard, joystick etc.
(ii) Internal Devices of the System Unit – Mother Board, Microprocessor, RAM Chips, Hard Disk, ROM Chips, Video Card, Printer Card.
(iii) Output devices - Monitor, Printer, Speaker etc.
(iv) Storage Devices – Floppy disk, CD ROM, Magnetic tape, Zip drive etc.
(v) Power Supply - CVT (Constant Voltage Transformer), UPS (Uninterruptible Power Supply)

Processing Unit

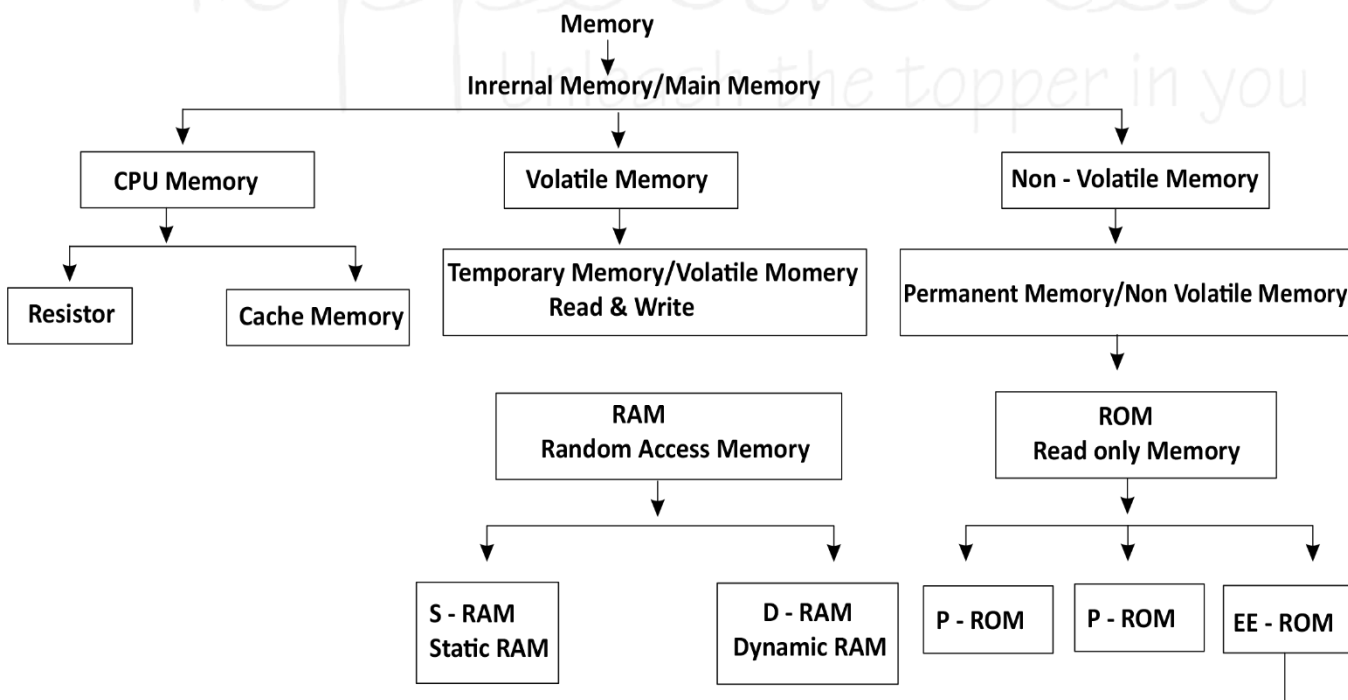- The part of the computer where work is done on the data is called the processing unit.

- It is also called CPU.
- The following parts of the processing unit -

CPU
Central Processing Unit

ALU (Arithmetic Logic unit) | CU (Control Unit)
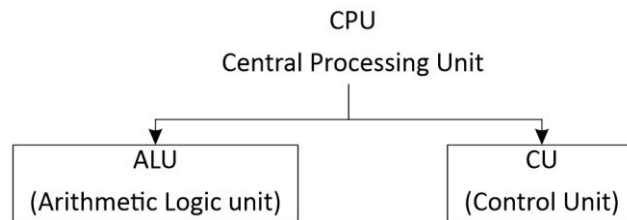
- A microprocessor is very similar in use to a CPU.
- Currently Pentium 11 (P-11) and Intel Pentium - 111 (P-111) microprocessors are in use.
  (i) Arithmetic Logical Unit -
  - All calculations are done in ALU.
  - Logic functions such as - AND, OR, EXOR, NOT etc.
  (ii) Control Unit -
  - Control units provide two types of signals.
    (I) Control signal
    (II) Timing signal

Processor Speed

- CU and ALU work at unbelievable speed. A cycle is the time in which a task is completed. Such as moving a byte of data from one memory location to another.
- Built-in clock speeds, which produce a pulse per second - are directly related to this clock speed, measured in MHz or GHz.

Memory
Inrernal Memory/Main Memory

CPU Memory | **Volatile Memory** | **Non - Volatile Memory**

Resistor | **Cache Memory**

Temporary Memory/Volatile Momery Read & Write

Permanent Memory/Non Volatile Memory

RAM Random Access Memory

ROM Read only Memory

S - RAM Static RAM | **D - RAM Dynamic RAM** | **P - ROM** | **P - ROM** | **EE - ROM**

→ **PROM - Programmable Read Only Memory**
→ **EROM - Erasable Programmable Read Only Memory**
→ **EEROM - Electrically Erasable Programmable Read Only Memory**