

COMPUTER APPLICATIONS CLASS X

CHAPTER – 1 HISTORY OF COMPUTERS

1. Define computer.

A computer is an electronic device which can store or process raw information or a set of data to produce useful information.

2. State major areas of application of computer.

Science, Education, Medicine and Health Care, Engineering, Entertainment, Communication, Business Application, Banking, Railways, Airlines etc.

Father of computer – Charles Babbage

Stored program concept given by Dr. John Von Neuman in 1945

First programmer in the world – Lady Ada Lovelace Augusta

Napier Bones invented by John Napier – 1617 AD

UNIVAC – Universal Automatic Computer – First commercial computer

ENIAC – Electronic numerical integrator and Calculator – first electronic computer.

Analytical Engine – prototype of modern computer.

First mechanical device used for calculations - **ABACUS**

10. Who invented ENIAC and when?

Ans: Prof. J. Presper Eckert and John W. Mauchly in 1946

11. Who developed transistor?

Ans: John Bardeen, William Shockley and Walter Barttain

12. What is UNIVAC (UNIVersal Automatic Computer)?

Ans: It is the first commercial computer.

13. Types of IC:

Ans: SSIC (Small Scale IC)

MSIC(Medium Scale IC)

LSIC (Large Scale IC)

VLSI(Very Large Scale IC)

ULSI(Ultra Large Scale IC)

Q. 14. Who is known as the first programmer in the world?

Ans: Lady Ada Lovelace Augusta

Types of Computers

1. Microcomputers / Personal Computers (PCs)

- These are small, low-cost computers used by individuals.

2. Minicomputers

- More powerful than microcomputers, used by small organisations for shared tasks.
- Can support multiple users at the same time.

3. Mainframe Computers

- Very powerful systems used by large organisations to process huge amounts of data.
- Support hundreds or thousands of users at once.

4. Supercomputers

- Fastest and most powerful computers in the world.
- Used for complex scientific calculations, weather forecasting, space research.

GENERATION OF COMPUTERS

Computers developed in **five generations**, each marked by major technological improvements:

1. First Generation (1940–1956):

Used **vacuum tubes**, were very large and consumed a lot of electricity.

Example: ENIAC, UNIVAC.

2. Second Generation (1956–1963):

Used **transistors**, were smaller, faster, and more reliable than vacuum tubes.

3. Third Generation (1964–1971):

Used **Integrated Circuits (ICs)**, which made computers more powerful and affordable.

4. Fourth Generation (1971–Present):

Uses **microprocessors**; computers became smaller, cheaper, and widely used (PCs, laptops).

5. Fifth Generation (Present & Future):

Based on **Artificial Intelligence**, robotics, quantum computing, and advanced parallel processing.

FEATURES OF THIRD GENERATION COMPUTERS:

1. Used Integrated Circuits (ICs), which made computers faster and more efficient.
2. Keyboards and monitors were introduced.
3. Produced less heat and consumed less power.

CHAPTER 2: THE BINARY CONCEPT

1. Conversion of decimal into binary, octal and hexadecimal
2. Conversion of binary, octal and hexadecimal to Decimal
3. Conversion from Octal to Binary and vice-versa
4. Conversion from hexadecimal to binary and vice-versa
5. addition and subtraction of binary, octal and hexadecimal numbers.
6. Finding 1's and 2's complement
7. subtraction using 1's and 2's complement.
8. Memory units

1. Define Number System.

Ans: A number system is defined a set of values or symbols used to represent quantities.

2. Define Base or Radix.

Ans: It is the number of symbols present in the number system.

3. Types of number system:

1. Positional Number System

Examples – Binary , decimal, octal, hexadecimal

2. Non – positional number system

Examples – Roman Number System

4. Types of positional number system:

Number System	Base or Radix (R)	Set of symbols	Example
Decimal	R = 10	0,1,2,3,4,5,6,7,8 and 9	$(25)_{10}$
Binary	R = 2	0 and 1	$(11001)_{10}$
Octal	R = 8	0,1,2,3,4,5,6 and 7	$(31)_{10}$
Hexadecimal	R = 16	0,1,2,3,4,5,6,7,8,9,A,B,C,D,E and F	$(19)_{10}$

7. Conversion: Decimal to Binary/Octal/Hexadecimal

Steps to be followed:

1. Divide the number by 2 / 8 / 16 and note down the remainder.
2. Repeat step1 until the quotient becomes 0.
3. Collect the remainders in the reverse order.

Ex: Convert 28_{10} into binary

Handwritten conversion of 28 to binary:

$$\begin{array}{r|l}
 2 & 28 \\
 \hline
 2 & 14 \\
 2 & 7 \\
 2 & 3 \\
 2 & 1 \\
 & 0
 \end{array}
 \begin{array}{l}
 0 \\
 0 \\
 1 \\
 1 \\
 1
 \end{array}
 \begin{array}{l}
 \uparrow \\
 \uparrow \\
 \uparrow \\
 \uparrow \\
 \uparrow
 \end{array}
 (11100)_2$$

Ex: Convert 28_{10} into Octal

Handwritten conversion of 28 to octal:

$$\begin{array}{r|l}
 8 & 28 \\
 \hline
 8 & 3 \\
 & 0
 \end{array}
 \begin{array}{l}
 4 \\
 3
 \end{array}
 \begin{array}{l}
 \uparrow \\
 \uparrow
 \end{array}
 (34)_8 \text{ Ans}$$

Ex: Convert 28_{10} into Hexadecimal

Handwritten conversion of 28 to hexadecimal:

$$\begin{array}{r|l}
 16 & 28 \\
 \hline
 16 & 1 \\
 & 0
 \end{array}
 \begin{array}{l}
 12-C \\
 1
 \end{array}
 \begin{array}{l}
 \uparrow \\
 \uparrow
 \end{array}
 (1C)_{16} \text{ Ans.}$$

Binary/Octal/Hexadecimal to Decimal

Handwritten examples of converting binary, octal, and hexadecimal to decimal:

1. Convert $(1101)_2$ into decimal

$$\begin{array}{r}
 3 \ 2 \ 1 \ 0 \\
 1 \ 1 \ 0 \ 1
 \end{array}
 \text{ Base} = 2$$

$$\begin{aligned}
 &= 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 \\
 &= 1 \times 8 + 1 \times 4 + 0 + 1 \times 1 \\
 &= 8 + 4 + 1 \\
 &= 13 \\
 &\therefore (13)_{10} \text{ Ans.}
 \end{aligned}$$
2. Convert $(34)_8$ into decimal

$$\begin{array}{r}
 3 \ 4 \\
 3 \ 4
 \end{array}
 \text{ Base} = 8$$

$$\begin{aligned}
 &= 3 \times 8^1 + 4 \times 8^0 \\
 &= 3 \times 8 + 4 \times 1 \\
 &= 24 + 4 \\
 &= 28 \\
 &\therefore (28)_{10} \text{ Ans.}
 \end{aligned}$$
3. Convert $(1A2)_{16}$ into decimal

$$\begin{array}{r}
 2 \ 1 \ 0 \\
 1 \ A \ 2
 \end{array}
 \text{ Base} = 16$$

$$\begin{aligned}
 &= 1 \times 16^2 + A \times 16^1 + 2 \times 16^0 \\
 &= 1 \times 256 + 10 \times 16 + 2 \times 1 \\
 &= 256 + 160 + 2 = 418 \\
 &\therefore (418)_{10} \text{ Ans.}
 \end{aligned}$$

Binary to octal		Binary	Hexadecimal
Binary	Octal	0000	0
000	0	0001	1
001	1	0010	2
010	2	0011	3
011	3	0100	4
100	4	0101	5
101	5	0110	6
110	6	0111	7
111	7	1000	8
		1001	9
		1010	A
		1011	B
		1100	C
		1101	D
		1110	E
		1111	F

Binary to Octal

An octal digit is represented by 3 binary digits. Therefore, make a group of 3 bits from Right hand side and write the octal equivalent of each groups. (using the above table)

Ex - Convert $(1101100110)_2$ into Octal

001 101 100 110 i.e. 1546 in Octal (refer to the table shown above)

Octal to Binary

Write the 3 digits binary equivalent of each octal digit

Ex - Convert $(4017)_8$ into Binary

4017 i.e. 100 000 001 111 i.e. 100000001111 in Binary (refer to the table shown above)

Binary to Hexadecimal

An hexadecimal digit is represented by 4 binary digits.

Therefore, make a group of 4 bits from Right hand side and write the Hexadecimal equivalent of each groups. (using the above table)

Ex - Convert $(1101100110)_2$ into Hexadecimal

0011 0110 0110 i.e. 366 in Hexadecimal (refer to the table given above)

Hexadecimal to Binary

Write the 4 digits binary equivalent of each hexadecimal digit (using the above table)

Ex - Convert $(A9F)_{16}$ into Binary

4017 i.e. 0100 0000 0001 0111 i.e. 010000000010111 in Binary (refer to the table given above)

8. Binary Arithmetic

(i) **Binary Addition:** Use the following rules to add two binary numbers.

A	B	Carry	Sum
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

Note: when u add three 1s , then sum and carry will be 1.

Ex: Add 1110110 with 1111010

$$\begin{array}{r}
 1110110 \\
 1111010 \\
 \hline
 1110100
 \end{array}$$

Learn Octal addition and hexadecimal addition.

1.1. Complement

Complement is a method which can be used to make the subtraction easier for machines. Generally, it is used to represent negative numbers.

- (a) To find 1's complement: change 0 into 1 and 1 into 0.
- (b) To find 2's complement: result of 1's complement + 1

Ex: Find 1's and 2's complement of 110010100_2

- (a) 1's complement = 001101011
- (b) 2's complement = 001101011 + 1 = 001101100

A. Binary subtraction using 1's complement.

Steps: 1. First check whether the number of digits of the given binary numbers are equal, if not, then balance it by adding 0s to the leftmost side.

- 2. Find 1's complement of the negative number.
- 3. Add it with the positive number

4. Observe the result.

- a. If carry occurs in the result, then remove it and add 1 to the result to get the answer.
- b. If carry does not occur in the result, then find its 1's complement and place a negative sign (-) at the front to get the answer.

Ex. 1. Subtract 110 from 1011 using 1's complement.

Given, $1011 - 110$

Step 1: Since the no. of digits of these binary numbers are not equal, so we are adding 0s to make them equal.

Now, $1011 - 0110$

Step 2: We need to find 1's complement of the negative number (i.e. 0110) .

1's complement of 0110 = 1001

Step 3: Adding the result 1001 with the positive number (i.e. 1011)

$$\begin{array}{r}
 1011 \\
 1001 \\
 \hline
 10100
 \end{array}$$

Step 4: Since carry occurred in the result, we remove the carry (i.e. 0100) and add 1 to it (i.e. $0100 + 1 = 0101$)

The required answer is 0101.

B. Binary subtraction using 2's complement.

Steps: 1. First check whether the number of digits of the given binary numbers are equal, if not, then balance it by adding 0s to the leftmost side.

2. Find 2's complement of the negative number.

3. Add it with the positive number

4. Observe the result.

a. If carry occurs in the result, then remove it and write the remaining as the answer.

b. If carry does not occur in the result, then find its 2's complement and place a negative sign (-) at the front to get the answer.

Ex. Subtract 110 from 1011 using 2's complement.

Given, $1011 - 110$

Step 1: Since the no. of digits of these binary numbers are not equal, so we are adding 0s to make them equal.

Now, $1011 - 0110$

Step 2: We need to find 2's complement of the negative number(i.e. 0110) .

1's complement of 0110 = 1001

2's complement of 0110 = $1001 + 1 = 1010$

Step 3: Adding the result 1010 with the positive number (i.e.1011)

$$\begin{array}{r} 1011 \\ 1010 \\ \hline 10101 \end{array}$$

Step 4: Since carry occurred in the result, we remove the carry (i.e. 0101).

The required answer is 0101.

MEMORY UNITS

A single binary digit – 1 bit

Group of bits carry information – 1 word

1 Nibble = 4 bits

1 Byte (B) = 8 Bits

1 Kilobyte (KB) = 1024 Bytes

1 Megabyte (MB) = 1024 KB

1 Gigabyte (GB) = 1024 MB

1 Terabyte (TB) = 1024 GB

1 Petabyte (PB) = 1024 TB

CHAPTER 3

BOOLEAN ALGEBRA

1. Draw truth table

2. Draw Logic diagram

3. Universal gates – NAND and NOR - why

4. Basic logic gates – AND, OR , NOT – why

5. Truth table of AND, OR, NOT, NAND, NOR, XOR AND XNOR gates.

6. NOT gate is known as inverter.

What is a Logic Gate?

A **logic gate** is an electronic circuit that performs a **logical operation** on one or more input signals and produces a single output.

Logic gates work mainly with **binary values**:

- **0** = OFF / False
- **1** = ON / True

They are the basic building blocks of **digital electronic circuits** and are used in computers, calculators, mobile phones and other digital devices.

CHAPTER 4: STRUCTURE OF COMPUTER

Q. 1. Define Hardware and Software.

Ans: Hardware is the physical component of a computer system that we can touch. Ex- monitor, keyboard, mouse, scanner, printer etc.

Software is a set of instructions written for the effective utilization of the hardware. Ex- Operating System(Android, Windows, iOS etc.), compiler, antivirus, whatsapp, games, video editor etc.

Q.2. Describe the block diagram of a computer system.

Ans - **block diagram is given in the book – chapter 4. It is a simple diagram.**

A computer system essentially has four important components;

(a) Central Processing Unit (CPU): It is considered as the heart and brain of the computer system. It performs processing of instructions and data inside the computer.

(b) Input Device: It is the device through which instructions and data are entered into the computer system from the external world. Ex: Keyboard, mouse, scanner, barcode reader, touchscreen, microphone etc.

(c) Output Device: It is the device through which the results are displayed to the user. Ex. Monitor(VDU), printer, soundbox, projector, touchscreen, Plotter etc.

(d) Mass Storage Unit: It is a memory in which data can be stored which remain as it is when the power is withdrawn. Ex. Hard Disk, pendrive, CD, DVD, SSD

Q.6. Write short on CPU.

Ans: CPU can be considered as the heart(memory unit), brain (ALU) and nervous system (control unit) of the computer.

CPU consists of three parts:

(a) Arithmetic Logic Unit: This unit performs the arithmetical (add, subtract, multiply, divide) and logical operations (and, or, not) on the stored data.

(b) Control Unit: It controls all functioning of a computer. It co-ordinates Input, Output and Memory Units. It controls execution of instructions.

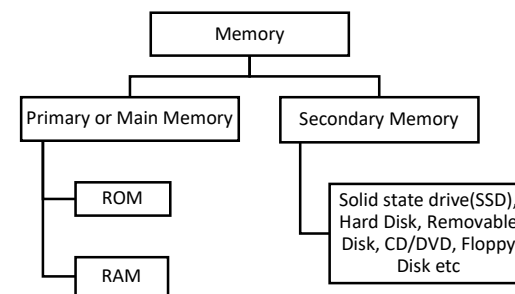
(c) Primary storage Unit or Memory Unit: In this unit, data and instructions are stored.

Q. 7. Difference between RAM and ROM.

Ans: RAM is a temporary memory but ROM is a permanent memory.

RAM is volatile in nature(i.e. its content will get erased when machine is turned off) but ROM is non-volatile.

Q.9. What are the different parts of Memory



Q. 10. What is Cache Memory?

It is a special type of fast access memory which is used in high speed computers to work as a buffer and is placed between CPU and RAM.

Chapter 7 DOS

Q.1. What is DOS? Classify DOS?

Ans: DOS is an operating system that runs from a disk storage device, such as a floppy disk, hard disk drive, or optical disc.

DOS may be classified in two categories:

- a) MS – DOS - developed by Microsoft Co.
- b) PC – DOS - developed by IBM Co.

Q.2. What are the types of booting?

The types of booting are cold booting and warm booting.

a) Cold booting or Booting: It is the process of loading the operating system from HDD (Hard Disk Drive) into RAM(Random Access Memory) after checking all units of computer system and is generally performed by turning on the power for the first time.

b) Warm booting: It is the process of loading the operating system from HDD (Hard Disk Drive) into RAM(Random Access Memory) without checking the units of computer system and is performed when computer is in working condition, without turning off the power.

Q.4. Which characters are known as Wildcard characters?

? and * are known as wildcard characters in DOS.

? means any one character

* means any number of character

Q. 5. Write four differences between DOS and Windows.

Study from book. It is very simple.

Q. 6. Functions of DIR, CHDIR or CD, MKDIR or MD, TREE, TYPE, RMDIR or RD commands in DOS.

Study from book

Chapter 8 : WORD PROCESSING

1. Short note on Word processing.

Word processing is an application where words are arranged together to form a document i.e. a letter, a note, a contract, an essay, a poem or a book.

Instead of using a typewriter that puts word on paper, these words are to be typed into a computer which displays them on a screen and allows to make any number of changes. Then the computer can store the final draft and a printer linked to the computer can produce perfect copies, when required. In computer based system, Word processing implies the entering, editing, storing and printing of textual material. Example: Microsoft Word.

2. Document creation device: The device which are used to create a document is called document creation device. Example: Keyboard, monitor, printer etc.

3. Advantages of Word Processing

- a. The word documents can be created easily.
- b. It provides spelling and grammar checking facility.
- c. It allows the user to edit the documents.
- d. It provides WYSIWYG feature, i.e. “what you see is what you get”.

7. Alignments: There are 4 kinds of alignment.

Align Left, Align Right, Center, Justify.

8. **Indentation:** There are 4 indents. Left Indent, Right Indent, First line Indent and Hanging Indent.

9. **Format painter:** It is used to copy the formatting attributes or styles.

10. **Page Orientation:** It refers to the direction in which a page is positioned for viewing or printing. There are two main types of page orientation:

Portrait and Landscape

11. **Page Margin:** A **page margin** is the blank space around the edges of a page.

Typically, a page has four margins:

- **Top margin** – space at the top of the page.
- **Bottom margin** – space at the bottom.
- **Left margin** – space on the left side.
- **Right margin** – space on the right side.

12. **Page Size :** It refers to the dimensions or physical size of a page on which a document is displayed or printed.

Some common page sizes are: A4, A3, A5, Letter, Legal etc.

12. **Clipboard:** It is a reserved space in memory where we can store text temporarily. It can only hold text from one Copy or Cut. Therefore, when we use Paste, the text from the clipboard is pasted in the clicked area.

Cut (ctrl + x) → Paste (ctrl + v) means moving the data

Copy (ctrl+c)→ Paste means creating a duplicate data.

13. **Print (ctrl + P):** It allows to print word document currently displayed on the screen or to modify the print option before printing.

14. **Print Preview:** Using this option, the user can always preview the printing before taking the final print out.

15. Difference between save and save as in MS word.

Difference between Save and Save As in MS Word:

- **Save:** Updates the existing document with the latest changes without changing its name or location.
- **Save As:** Creates a **new copy** of the document, allowing you to change the **file name, file type, or location** before saving.

16. **Difference between copy paste and cut paste.**

- **Copy-Paste:** Makes a **duplicate** of the selected text or item and pastes it elsewhere. The **original remains** in its place.
- **Cut-Paste: Removes** the selected text or item from its original place and pastes it to a new location.

17. Few shortcuts and extensions:

Ctrl + N to open a new document
Ctrl + O to open an existing document
Ctrl + S to save the document
Alt + F4 to exit from MS word
Ctrl + Shift + C Format Painter
Ctrl + Z Undo the last operation
Ctrl + Y Redo the last operation
Ctrl + A Select all
