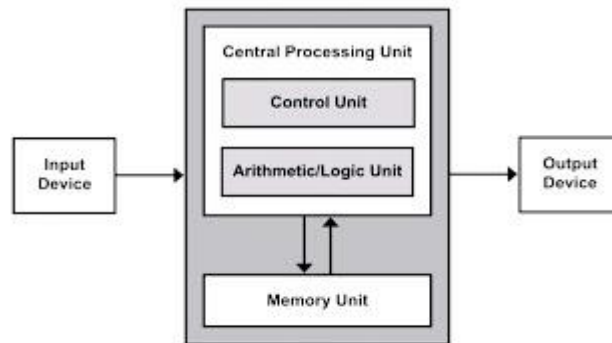# ASSIGNMENT - 1

FUNDAMENTALS OF IT & PROGRAMMING

PUNNYA.S.S

Q1.What are the four fundamental parts of a computer? Explain it with the help of diagram.

1. INPUT DEVICE

Input Device is a Device by which we can input our data or instructions into Computer. Computer has many Input Devices, it directs the brain to Devices Computer. Input Device is available in many different ways and everyone has a specific purpose.

"Input Device is the device that gives our instructions to the computer's brain, C.P.U. "

There are several types of Input Device, which are as follows -

- Keyboard
- Mouse
- Trackball
- Light pen
- Touch screen
- Digital Camera
- Scanner

2. C.P.U

The full form of C.P.U is Central process Unit. This is the main part of the computer. That is, without this, the computer system can not be completed, so all the devices are connected, such as Keyboard, Mouse, Monitor etc. It is also called Mind of Computer. Its main function is to execute the programs (Execute), and in addition to all the components of C.P.U Computer, such as Memory, Input, Output Devices also control the functions.

C.P.U (Central Processing Unit) has three parts -

- Arithmetic Logical Unit (A.L.U)
- Memory
- Control Unit (C.U)

(a) A.L.U. (Arithmetic Logic Unit)

The Arithmetic and Logic unit is briefly called A.L.U. This unit uses arithmetic functions (add, subtract, multiply, part) and logical operations on data. Takes direction from the A.L.U Control Unit. It receives data from memory and returns the information after processing to the memory. The speed of the work of A.L.U is very intense. It performs approximately 100,000 calculations per second. It contains an electronic circuit that is capable of calculating binary arithmetic.

(b) Memory

It stores the instructions received by Input Device in the computer, where it also goes to the memory of Computer. In humans, there are many things to remember, so are memory. This memory is integral to C.P.U., it is a storage device. Therefore, it is also called main memory of computer, internal memory, or primary memory.

"The location of the computer where all the information, instructions are stored"

(c) C.U (Control Unit)

The full form of the C.U. is control unit. C.U. Controls and operates the functions of the hardware. It controls Input, Output, and Memory and A.L.U. intermittently directs the exchange of data; this program obtains instructions from the memory to execute the program. By converting instructions into Electric Signals, it reaches the appropriate devices.

3. OUTPUT DEVICE

Output Device is a device that provides data input by User as Result. The results obtained from the computer are achieved by the Output Device, these results are usually presented to the user by the display device (screen) or the printer. Mainly the information received in the form of Output, we can either see the screen cross or print from the printer to the page or use the speaker as the output to listen to music, Output Device is of several types like -

- Monitor
- Printer
- Plotter
- Projector
- Sound Speaker

Q2.Discuss about the classification of computers based on size and capacity

(a) Microcomputers (personal computers)

Microcomputers became the most common type of computer in the late 20th century. The term "microcomputer" was introduced with the advent of systems based on single-chip microprocessors. The best-known early system was the Altair 8800, introduced in 1975. The term "microcomputer" has practically become an anachronism.

These computers include:

- Desktop computers – A case put under or on a desk. The display may be optional, depending on use. The case size may vary, depending on the required expansion slots. Very small computers of this kind may be integrated into the monitor.
- Rackmount computers – The cases of these computers fit into 19-inch racks, and maybe space-optimized and very flat. A dedicated display, keyboard, and mouse may not exist, but a KVM switch or built-in remote control (via LAN or other means) can be used to gain console access.
- In-car computers (carputers) – Built into automobiles, for entertainment, navigation, etc.
- Laptop Computers and notebook computers – Portable and all in one case.
- Tablet computer – Like laptops, but with a touch-screen, entirely replacing the physical keyboard.
- Smartphones, smart books, and Palmtop computers – Small handheld personal computers with limited hardware specifications.
- Programmable calculator– Like small handhelds, but specialized in mathematical work.
- Video game consoles – Fixed computers built specifically for entertainment purposes.
- Handheld game consoles – The same as game consoles, but small and portable.

(b) Minicomputers (mid-range computers)

Minicomputers (colloquially, minis) are a class of multi-user computers that lie in the middle range of the computing spectrum, in between the smallest mainframe computers and the largest single-user systems (microcomputers or personal computers). The term supermini computer or simply supermini was used to distinguish more powerful minicomputers that approached mainframes in capability. Superminis (such as the DEC VAX or Data General Eclipse MV/8000) were usually 32-bit at a time when most minicomputers (such as the PDP-11 or Data General Eclipse or IBM Series/1) were 16-bit. These traditional minicomputers in the last few decades of the 20th Century, found in small to medium-sized businesses, laboratories and embedded in (for example) hospital CAT scanners, often would be rack-mounted and connect to one or more terminals or tape/card readers, like mainframes and unlike most personal computers, but require less space and electrical

power than a typical mainframe. The contemporary term for minicomputer is midrange computer, such as the higher-end SPARC, POWER and Itanium-based systems from Oracle Corporation, IBM and Hewlett-Packard, and the size is now typically smaller, such as a tower case.

(c) Mainframe computers

The term mainframe computer was created to distinguish the traditional, large, institutional computer intended to service multiple users from the smaller, single-user machines. These computers are capable of handling and processing very large amounts of data quickly. Mainframe computers are used in large institutions such as government, banks, and large corporations. They are measured in MIPS (million instructions per second) and can respond to hundreds of millions of users at a time.

(d) Supercomputers

A Supercomputer is focused on performing tasks involving intense numerical calculations such as weather forecasting, fluid dynamics, nuclear simulations, theoretical astrophysics, and complex scientific computations. A supercomputer is a computer that is at the front-line of current processing capacity, particularly speed of calculation. The term supercomputer itself is rather fluid, and the speed of today's supercomputers tends to become typical of tomorrow's ordinary computer. Supercomputer processing speeds are measured in floating-point operations per second, or FLOPS. An example of a floating-point operation is the calculation of mathematical equations in real numbers. In terms of computational capability, memory size and speed, I/O technology, and topological issues such as bandwidth and latency, supercomputers are the most powerful, are very expensive, and not cost-effective just to perform batch or transaction processing.

Q3.What is the meaning of computer generation? How many computer generations are defined? What technologies are/were used?

Generation in computer terminology is a change in technology of a computer is/was being used. Initially, the generation term was used to distinguish between varying hardware technologies. Nowadays, generation includes both hardware and software, which together make up an entire computer system.

There are five computer generations known till date. Each generation has been discussed in detail along with their time period and characteristics. In the following table, approximate dates against each generation has been mentioned, which are normally accepted.

Following are the main five generations of computers.

Generations	Period	Technology Used
First Generation	1946-1959	Vacuum tube based
Second Generation	1959-1965	Transistor based
Third Generation	1965-1971	Integrated Circuit based
Fourth Generation	1971-1980	VLSI microprocessor based
Fifth Generation	1980-till date	ULSI microprocessor based

(a) First Generation (1946-1959)

The computers of first generation used vacuum tubes as the basic components for memory and circuitry for CPU (Central Processing Unit). These tubes, like electric bulbs, produced a lot of heat and the installations used to fuse frequently. Therefore, they were very expensive and only large organizations were able to afford it.

In this generation, mainly batch processing operating system was used. Punch cards, paper tape, and magnetic tape was used as input and output devices. The computers in this generation used machine code as the programming language.

The main features of the first generation are −

- Vacuum tube technology
- Unreliable
- Supported machine language only
- Very costly
- Generated a lot of heat
- Slow input and output devices
- Huge size
- Need of AC
- Non-portable
- Consumed a lot of electricity

Some computers of this generation were −

- ENIAC
- EDVAC
- UNIVAC
- IBM-701

(b) Second generation (1959-1965)

In this generation, transistors were used that were cheaper, consumed less power, more compact in size, more reliable and faster than the first generation machines made of vacuum tubes. In this generation, magnetic cores were used as the primary memory and magnetic tape and magnetic disks as secondary storage devices.

In this generation, assembly language and high-level programming languages like FORTRAN, COBOL were used. The computers used batch processing and multiprogramming operating system.

The main features of second generation are −

- Use of transistors
- Reliable in comparison to first generation computers
- Smaller size as compared to first generation computers
- Generated less heat as compared to first generation computers
- Consumed less electricity as compared to first generation computers
- Faster than first generation computers
- Still very costly
- AC required
- Supported machine and assembly languages

Some computers of this generation were −

- IBM 1620
- IBM 7094
- CDC 1604
- CDC 3600

(c) Third Generation(1965-1971)

The computers of third generation used Integrated Circuits (ICs) in place of transistors. A single IC has many transistors, resistors, and capacitors along with the associated circuitry.

The IC was invented by Jack Kilby. This development made computers smaller in size, reliable, and efficient. In this generation remote processing, time-sharing, multiprogramming operating system were used. High-level languages (FORTRAN-II TO IV, COBOL, PASCAL PL/1, BASIC, ALGOL-68 etc.) were used during this generation.

The main features of third generation are −

- IC used
- More reliable in comparison to previous two generations
- Smaller size
- Generated less heat
- Faster
- Lesser maintenance
- Costly
- AC required
- Consumed lesser electricity
- Supported high-level language

Some computers of this generation were −

- IBM-360 series
- Honeywell-6000 series
- PDP (Personal Data Processor)
- IBM-370/168

(d) Fourth Generation(1971-1980)

Computers of fourth generation used Very Large Scale Integrated (VLSI) circuits. VLSI circuits having about 5000 transistors and other circuit elements with their associated circuits on a single chip made it possible to have microcomputers of fourth generation.

Fourth generation computers became more powerful, compact, reliable, and affordable. As a result, it gave rise to Personal Computer (PC) revolution. In this generation, time sharing, real time networks, distributed operating system were used. All the high-level languages like C, C++, DBASE etc., were used in this generation.

The main features of fourth generation are −

- VLSI technology used
- Very cheap
- Portable and reliable
- Use of PCs
- Very small size
- Pipeline processing
- No AC required
- Concept of internet was introduced
- Great developments in the fields of networks
- Computers became easily available

Some computers of this generation were −

- DEC 10
- STAR 1000
- PDP 11

- CRAY-1(Super Computer)

(e) Fifth Generation(1980-till date)

In the fifth generation, VLSI technology became ULSI (Ultra Large Scale Integration) technology, resulting in the production of microprocessor chips having ten million electronic components.

This generation is based on parallel processing hardware and AI (Artificial Intelligence) software. AI is an emerging branch in computer science, which interprets the means and method of making computers think like human beings. All the high-level languages like C and C++, Java, .Net etc., are used in this generation.

AI includes −

- Robotics
- Neural Networks
- Game Playing
- Development of expert systems to make decisions in real-life situations
- Natural language understanding and generation

The main features of fifth generation are −

- ULSI technology
- Development of true artificial intelligence
- Development of Natural language processing
- Advancement in Parallel Processing
- Advancement in Superconductor technology
- More user-friendly interfaces with multimedia features
- Availability of very powerful and compact computers at cheaper rates

Some computer types of this generation are −

- Desktop
- Laptop
- NoteBook
- UltraBook

- ChromeBook

Q4. Differentiate between volatile and non-volatile memory

Volatile and Non-Volatile Memory are both types of computer memory. Volatile Memory is used to store computer programs and data that CPU needs in real time and is erased once computer is switched off. RAM and Cache memory are volatile memory. Whereas Non-volatile memory is static and remains in the computer even if

computer is switched off. ROM and HDD are non-volatile memory. Following are the important differences between Volatile and Non-Volatile Memory.

Sr. No.	Key	Volatile Memory	Non-Volatile Memory
1	Data Retention	Data is present till power supply is present.	Data remains even after power supply is not present.
2	Persistence	Volatile memory data is not permanent.	Non-volatile memory data is permanent.
3	Speed	Volatile memory is faster than non-volatile memory.	Non-volatile memory access is slower.
4	Example	RAM is an example of Volatile Memory.	ROM is an example of Non-Volatile Memory.
5	Data Transfer	Data Transfer is easy in Volatile Memory.	Data Transfer is difficult in Non-Volatile Memory.
6	CPU Access	CPU can access data stored on Volatile memory.	Data to be copied from Non-Volatile memory to Volatile memory so that CPU can access its data.
7	Storage	Volatile memory less storage capacity.	Non-Volatile memory like HDD has very high storage capacity.
8	Impact	Volatile memory such as RAM is high impact on system's performance.	Non-volatile memory has no impact on system's performance.
9	Cost	Volatile memory is costly per unit size.	Non-volatile memory is cheap per unit size.

Q5. Distinguish between system software,application software and open source software on the basis of their features

1. System software:

It is a type of software that is designed to run computer's hardware and application programs.Softwares like Operating Systems, Compilers, Editors, and drivers etc. come under this category. A computer cannot function without the presence of system software. System software is the interface between the hardware and the use applications.

2. Application software:

It is a software created for a specific purpose used by end users. It can be called as application are simply an app. Eg:-Word processor, Accounting application, A web browser, an email client, Media player etc.

3. Open Source Software:-

It is a type of computer software in which source code is released under a licence in which the copyright holder grants users right to study, change and distribute the software to anyone and for any purpose. The Linux operating system is the best known examples of open source software.

Q6. (a) Create a file in MS-word to insert a paragraph about yourself and save it with file name "yourself". Describe all steps involved in it.

1. Click Microsoft office button
2. Select New
3. Select New document from the dialogue that box appears.
4. Then select Blank document
5. Select the Paragraph group's dialog box launcher and Select the Special menu arrow in the Paragraph dialog box.
6. Select First line in the Special drop-down menu and use the increment arrows to adjust the length of the indent .Make any additional adjustments to alignment or line spacing.
7. Select the OK button to save your selection(s) and close the Paragraph dialog box.
8. Type the content.
9. Save the file by selecting in the order File >save as
10. Type file name to "yourself" and click save

Q6. (b) Write steps regarding followings

➢ To change the font style

1. Select the text you want to modify
2. Click the font style box on the home tab and the font style drop down menu will appear.
3. Move the cursor over the various font styles.
4. Left-click on the required font style and then the font style will be changed on the document

> ➢ **To change the font size**

1. First select the text which the font size is to be changed.

2. Then click the font size box and change the font size which is required

> ➢ **To change the font color**

1. Select text which you want to modify

2. Click on the font color tab on the home tab and the font color tab will appear.

3. Move the cursor over various colors that appeared in the menu and select the appropriate one by Left-clicking on it

> ➢ **To highlight (in yellow) the line that reads "need to get IMS's address".**

1. Select the text which is to be modified

2. Click Text Highlight Color from the font group of home tab.

3. Click on the color you want and the text will be highlighted with the selected color

Q7.Create a file in MS-Word for the following document and save it with the file name 'ms_word'. Describe all steps involved.

MS Word

Ms word is a widely used commercial <u>word processor</u> developed by Microsoft

MS word is application software which is capable of

- Typing

- Editing

- Saving and

- Printing any type of document.

1. Open Ms word, select new document and click on blank document.

2. Now type the word "MS word" and select the text.

3. Change the font style to Title by selecting it from the font styles menu of home tab

4. Type the two sentences as seen in the above document.

5. To underline the word "word processor". Select the text and click the underline button on the home tab.

6. Now we have to type the rest of the content before selecting the bullets and numbering button from the paragraph menu of the home tab. Select the appropriate bullet and click enter after completing each bullet

7. Save the file by selecting save as from file menu and type file name as "ms_word". Click save

Q8.create a file in MS word for the following document and save it with file name 'equations'. Describe all steps involved in it.

Equations

$X_2 + Y_5 = 30$

$Z^2 + Q^4 = 50$

$A_2 + B^8 = X_2 + Y^8$

1. Type the equation on word and select the text which we want to convert to superscript or subscript

2. Then select superscript button from the font group of home tab to make the selected text superscript or select the subscript button from the font group to make the text subscript

Q9.Create a file in MS-word that convert existing highlight to table as shown below and save it as file name 'text_to_table'. Describe all steps involved in it.

Select the text you want to convert.
Select the insert tab.
Click on Table command. A dialogue box appears.
Click on Convert Text to Table,a new dialogue box appears
Here,set number of columns.
Click on OK.Finally Selected text convert in a table

Select the text you want to convert.	Select the insert tab.
Click on Table command. A dialogue box appears.	Click on Convert Text to Table, a new dialogue box appears
Here,set number of coloumns.	Click on OK.Finally Selected text convert in a table

- Select the text you want to convert.
- Select the insert tab.
- Click on Table command. A dialogue box appears.
- Click on Convert Text to Table, a new dialogue box appears

- Here, set number of columns.
- Click on OK.
- Finally Selected text is converted into a table

Q10.Create a file in MS-word to insert a table in the document.Describe all steps involved.

1. Place your insertion point in the document where you want to insert table.
2. Select the insert tab.
3. Click the table command.
4. Drag your mouse over the diagram of squares to select the number of columns and rows required
5. Thus table is formed in the point selected.

Q11.Create following worksheet in MS-excel and save it with name 'book1'.

Roll no	Name	Marks			
1	n1	60			
2	n2	70			
3	n3	80			
4	n4	90			
5	n5	40			
6	n6	50			
7	n7	77			
8	n8	44			
9	n9	88			
10	n10	55			
sum of marks		654			
average of marks		65.4			
highest marks		90			
minimum marks		40			

Q12.Calculate the following things of a range (C2:C11) of data in the worksheet created in the question no.11

- **The sum of the marks using Autosum in a range of cells (C2:C11)**

  sum of the marks using Autosum=654

- **Average of the marks in a range of cells (C2:C11)**

  Average of the marks=65.4

- **Highest marks in a range of cell (C2:C11)**

  Highest marks=90

- **Minimum marks in a range of cells (C2:C11)**

Minimum marks=40

Q13. (a)Describe various steps involved in the following

- **To modify column width of a worksheet.**

1. Position the cursor over the column line in the column heading , and a double arrow will appear.

2. Left –click mouse ,then drag the right to increase column width or left to decrease the column width.

3. Release the mouse button.

- **To modify the row height of a worksheet.**

1. Position the cursor over the row line you want to modify , and a double arrow will appear.
2. Left –click mouse ,then drag the cursor downward to increase row height or upward to decrease the row height.
3. Release the mouse button.

- **To delete rows and columns of a worksheet.**

1. Select the row or column you want to delete.
2. Click the Delete command in the cells group on the Home tab.
3. Selected column or row will be deleted.

Q13.(b)Describe following terms in worksheet

- **Absolute reference and relative reference in formula.**

1. Relative references:-

Cell references in formula automatically adjust to new locations when the formula is pasted into different cells. This is called relative reference'

2. Absolute references:-

Cell references in a formula always refer to same cell or cell range. If a formula is copied to a different location ,the absolute reference remains the same

- **Cell address.**

Each rectangle in the worksheet is called a cell. Each cell has a name, or a cell address, based on the column and row where it is located.

Q14. (a) What tools are available to customise our powerpoint presentation?

1. Home

     The Home tab holds the Cut and Paste features, Font and Paragraph options, and what you need to add and organize slides.

2. Insert

     Click Insert to add something to a slide. This includes pictures, shapes, charts, links, text boxes, video and more.

3. Design

     On the Design tab, you can add a theme or color scheme, or format the slide background.

4. Transitions

     Set up how your slides change from one to the next on the Transitions tab. Find a gallery of the possible transitions in the Transition to This Slide group – click More button at the side of the gallery to see all of them.

5. Animations

     Use the Animations tab to choreograph the movement of things on your slides. Note that you can see many possible animations in the gallery in the Animation group, and see more of them by clicking More.

6. Slide Show

     On the Slide Show tab, set up the way that you want to show your presentation to others.

7. Review

     The Review tab lets you add comments, run spell-check, or compare one presentation with another (such as an earlier version).

8. View

     Views allow you to look at your presentation in different ways, depending on where you are in the creation or delivery process.

9. File

     At one end of the ribbon is the File tab, which you use for the behind-the-scenes stuff you do with a file, such as opening, saving, sharing, exporting, printing and managing your presentation. Click the File tab to open a new view called the Backstage.

Click from the list on the side to do what you want to do; for example, click Print to find the options and settings for printing your presentation. Click Back to document to return to the presentation that you were working on.

10. Tools tabs

When you click some parts of your slides, such as pictures, shapes, SmartArt or text boxes, you might see a colorful new tab appear.

Q14.(b) Write the steps for the following action for creation of powerpoint presentation

   ➤ **Open a blank presentation**

      1. Choose File→New. Backstage view opens, displaying
         tiles for various types of presentations you can create.
      2. Click the Blank Presentation tile. A new blank presentation opens.

   ➤ **Save the presentation as Lab1.pptx**

   1. Locate and select the save command on the Quick Access toolbar.
   2. Then the Save As pane will appear in the backstage view
   3. You'll then need to choose where to save the file and give it a file name.
   4. The save as dialogue will appear.

   ➤ **Add a title to the first slide; the name of your college**

   1. Click on the Title, Subtitle, or Text placeholder
   2. Type the name of the college.
   3. If necessary, press [Return] or [Enter] to move to a new line
   4. Click anywhere on the slide outside of the placeholder to deselect it.

   ➤ **Type your first name and last name in the suitable section.**

      1. Click on the Title, Subtitle, or Text placeholder
      2. Type your first name and last name..
      3. If necessary, press [Return] or [Enter] to move to a new line
      4. Click anywhere on the slide outside of the placeholder to deselect it.

   ➤ **Add a new slide which has a title and content**

   1. On the Home tab,click the New Slide button in the slides group,powerpoint
      adds a blank slide to your presentation.

      Or

   2. Press ctrl+M and again,powerpoint adds a blank slide

Or

3. Right-click in the slides or Outline tab on the left and then choose New slide. And again,Powerpoint adds a blank slide.

Q15.Write steps for creation of a set of powerpoint slides that demonstrates your skill to use the tools of powerpoint.It should include the following things

- ➢ **Title slide & bullet list**
- ➢ **Inserting Excel Sheet**
- ➢ **Clip art and Text**
- ➢ **Slide show effects**

To Create a presentation

1. Open PowerPoint.
2. Select an option:
   a. Select Blank Presentation to create a presentation from scratch.
   b. Select one of the templates.
   c. Select Take a Tour, and then select Create, to see tips for using PowerPoint.

To Add a slide

1. Select the slide you want your new slide to follow.
2. Select Home > New Slide.
3. Select Layout and the you type want from the drop-down

To Add and format text

1. Place the cursor where you want, and type.
2. Select the text, and then select an option on the Home tab: Font, Font size, Bold, Italic, Underline, ...
3. To create bulleted or numbered lists, select the text, and then select Bullets or Numbering.

To Add a picture, shape, or chart

Select Insert.

1. To add a picture:

   a. Select Picture.
   b. Browse for the picture you want and select Insert.
2. To add a shape, art, or chart:
   a. Select Shapes, Icons, SmartArt, or Chart.
   b. Select the one you want.

Part-2

Q16. What is the difference between Machine Language and High Level Language?

(a) Machine Language

Machine language, or machine code, is the only language that is directly understood by the computer, and it does not need to be translated. All instructions use binary notation and are written as a string of 1s and 0s. A program instruction in machine language may look something like this:

100101011001010011111010100110111100101

Technically speaking, this is the only language computer hardware understands.

(b) High Level Language

A high-level language is a programming language that uses English and mathematical symbols, like +, -, % and many others, in its instructions. When using the term 'programming languages,' most people are actually referring to high-level languages. High-level languages are the languages most often used by programmers to write programs. Examples of high-level languages are C++, Fortran, Java and Python.

Consider an ATM machine where someone wants to make a withdrawal of $100. This amount needs to be compared to the account balance to make sure there are enough funds. The instruction in a high-level computer language would look something like this:

x = 100

if balance x:

 print 'Insufficient balance'

else:

 print 'Please take your money'

This is not exactly how real people communicate, but it is much easier to follow than a series of 1s and 0s in binary code.

Q17. Discuss about different data types of c programming languages

There are 4 Data types in C:

- Basic
- Derived
- Void
- Enumeration

> ### Basic Data Types

These are also termed as primary or fundamental data types. Most of the time, for small programs, we use the basic fundamental data types in C – int, char, float, and double.

- ### int Data Type

Integer types can be signed (with negative values) or unsigned values (only positive). Int values are always signed unless specifically mentioned.Integer types are further classified as –

Data type	Range
int	
signed int	−32,768 to 32,767
unsigned int	0 to 65,535
short int	
signed short int	-2,147,483,648 to 2,147,483,647 (4 bytes)
unsigned short int	0 to 4,294,967,295 (4 bytes)
long int	
signed long int	-2,147,483,648 to 2,147,483,647 (4 bytes)
unsigned long int	0 to 4,294,967,295 (4 bytes)

- ### Char

Char stores a single character. Char consists of a single byte. Just like the int data type, char can be signed (range from -128 to +127) or unsigned (0 to 255). C stores the binary equivalent of the Unicode/ASCII value of any character that we type.

- ### Float

The floating point data type allows the user to type decimal values. For example, average marks can be 97.665. if we use int data type, it will strip off the decimal part and print only 97. To print the exact value, we need 'float' data type.

- ### Double

Float, double and long double are similar to short int, int, and long int. Double is 8 bytes, which means we can have more precision than float. This is useful in scientific programs that require precision. Float is just a single-precision data type; double is the double-precision data type. Long Double is treated the same as double by most compilers; however, it was made for quadruple data precision.

➢ Derived Data Types

Array, pointers, struct, and union are the derived data types in C.

- Array

Same as any other language, Array in C stores multiple values of the same data type. That means we can have an array of integers, chars, floats, doubles, etc. The array needs to be either initialized, or the size needs to be specified during the declaration.

- Pointers

Pointers are considered by many to be complex in C, but that is not the case. Simply put, a pointer is just a variable that stores the address of another variable. A pointer can store the address of variables of any data types. This allows for dynamic memory allocation in C. Pointers also help in passing variables by reference.

- Structs

A struct is a composite structure that can contain variables of different data types. For example, all the student data that we declared earlier in basic data types can be put under one structure. Instead of having the information scattered, when we give it a structure, it is easier to store information about more students.

- Union

With a union, we can store different data types in the same memory location. The union can have many members, but only one member can have a value at one time. Union, is thus, a special kind of data type in C. When we assign values to union data, union allocates enough memory to accommodate the largest data type defined. For example, since the name takes the biggest space in the memory out of all the other data types, the union will allocate the space taken by name.

- Enumeration

Enumeration data types enhance the readability of the code. If you have integer constants in the code that can be reused or clubbed together, we can use enums to define the constants.

- Void

The void is just an empty data type used as a return type for functions. The absence of any other data type is void. When you declare a function as void, it doesn't have to return anything.

Q18. Find the output of the following expressions

(a) x=20/5*2+30-5

X= 33

(b)y=30-(40/10+6)+10

Y=30

(c)z=40*2/10-2+10

Z=16

Q19.Describe the syntax of the following statements.

(a) If-else statement

An **if** statement can be followed by an optional **else** statement, which executes when the Boolean expression is false.

The syntax of an if...else statement in C programming language is −

```
if(boolean_expression) {
   /* statement(s) will execute if the boolean expression is true */
} else {
   /* statement(s) will execute if the boolean expression is false */
}
```

If the Boolean expression evaluates to true, then the if block will be executed, otherwise, the else block will be executed.

(b) For loop

A loop is used for executing a block of statements repeatedly until a given condition returns false. Syntax of for loop:

```
for (initialization; condition test; increment or decrement)
{
    //Statements to be executed repeatedly
}
```

(c) While loop

Syntax of while loop:

```
while (condition test)
```

```
{
     //Statements to be executed repeatedly
     // Increment (++) or Decrement (--) Operation
}
```

(d) Do while loop

Syntax of do-while loop

```
do
{
    //Statements

}while(condition test);
```

Q20.Find the output of the following program segments

a)	b)	c)

#include,stdio.h>
 Int main()
 {
  Int I;
  For (i=1;i<2;i++)
 {
   Printf ("IMS Ghasiabad\n");
 }
	#include<stdio.h>
	 Int main()
	 {
	   Int i=1;
	   While (i<=2)
	 {
	   Printf("IMS Ghasiabad\n");
	 I=i+1;
	 }
		#include<stdio.h>
		 Void main()
		 {
		   Int a=10,b=100;
		   If (a>b)
		   Printf ("Largest number is%d\n",a);
		 Else
		   Printf("Largest number is %d\n",b);
		 }

Output of (a) = IMS Ghaziabad

Output of (b) = IMS Ghaziabad

       IMS Ghaziabad

Output of (c) = Largest number is %d

        b