

**STD: XI****FULL PORTION TEST  
COMPUTER SCIENCE****Maximum Marks: 70****Time Allowed: 3.00 Hrs.****Note: i) Answer all the questions.****PART – I****15 X 1 = 15****ii) Choose the most suitable answer and write the code with corresponding answer.**

- \_\_\_\_\_ output device is used for printing building plan.  
a) Thermal printer    b) Plotter    c) Dot matrix    d) inkjet Printer
- In decimal, 1 kilo represents 1000 that is \_\_\_\_\_.  
a)  $10^2$     b)  $10^3$     c)  $2^{10}$     d)  $2^4$
- Which of the following device identifies the location when address is placed in the memory Address register?  
a) Locator    b) Encoder    c) Decoder    d) Multiplexer
- The shortcut key used to rename a file in windows  
a) F<sub>2</sub>    b) F<sub>4</sub>    c) F<sub>5</sub>    d) F<sub>6</sub>
- Familiar operating system developed by \_\_\_\_\_.  
a) Microsoft corporations    b) Apple    c) Android    d) acer
- What was the original name given to C++?  
a) CPP    b) Advanced    c) C with classes    d) Class with C
- This can be used alternate to endl command:  
a) \ t    b) \ b    c) \ o    d) \ n
- A recursion statement must have at least \_\_\_\_\_ case.  
a) one    b) Two    c) Many    d) Multiple.
- Which of the following is the scope operator?  
a) >    b) &    c) %    d) ::
- \_\_\_\_\_ are statements that alter the sequence of flow of instructions.  
a) sequence statement    b) selection statement  
c) iteration statement    d) control statement
- Which of the following supports the transitive nature of data?  
a) Inheritance    b) Encapsulation    c) Polymorphism    d) Abstraction
- Which of the following is invalid prototype for function overloading?  
a) Valid fun (intx) ;    b) Valid fun (intx) ;  
c) Valid fun(double d);    d) Valid fun(double d);  
Valid fun (char ch) ;    Valid fun (inty) ;    Valid fun (char ch) ;    Valid fun (intx) ;
- Find the odd one out.  
a) salami slicing    b) spoofing    c) pharming    d) Identity of theft
- The constructors are executed in the order of \_\_\_\_\_.  
a) Base class    b) Derived class    c) Inherited class    d) super class
- A Tamil virtual university was established on \_\_\_\_\_.  
a) 17Feb2001    b) 17Apr2003    c) 17Jan2005    d) 17Mar2007

**PART - II****Note: Answer any six questions. Question No. 24 is compulsory****6 X 2 = 12**

- Distinguish between primary memory and secondary memory.
- What is a program counter?
- How do we refine a statement?
- What is polymorphism?
- Differentiate save and save as option.
- Define loop invariant with an example.
- Write the rules for function overloading.

23. List out the methods of invoking constructors with an example.  
 24. Write the output of the following code.

```
#include<iostream>
int main( )
{
    double var 1=87.25255;
    cout<<(float)var 1<<endl;
    cout<<(int)var 1<<endl;
}
```

### PART - III

**Note: Answer any six questions. Question No.33 is compulsory**

**6 X 3 = 18**

25. What is the significant of monitor?  
 26. Differentiate computer Organisation from computer Architecture.  
 27. List out the prominent operating system.  
 28. What is called My Computer with give an example.  
 29. Define a function to double a number in two different ways: (1)  $n+n$  (2)  $2 \times n$   
 30. Write a c++ program to display number from 1 to 10.  
 Except 5 using 'for' and 'continue' statement.  
 31. Why is main function special?  
 32. Discuss the benefits of constructor overloading.  
 33. Write the syntax of operator overloading with an example.

### PART - IV

**Note: Answer all the questions:**

**5 X 5 = 25**

34. a) Explain the following (a) Inkjet Printer (b) Multimedia projector (c) Bar code /QR code Reader  
 (OR)  
 b) i) Write the procedure to convert Binary to Hexadecimal conversion.  
 ii) Convert the following Octal to Binary numbers –a) 645 b) 145  
 35. a) Explain the concept of a Distributed operating system along with its advantages. (OR)  
 b) Explain the Derived gates with expression and truth table.  
 36. a) Write the output of the of the following program.  

```
#include<iostream>
Using namespace std;
int main( )
{
    Char dev[5][10]={"Monitor","Speaker","Printer","Scanner","Keyboard"};
    For(int i=0; i<5; i++)
        Cout<<dev[i]<<"\n";
}
```

 (OR)  
 b) Explain call by value method with suitable example.  
 37. a) Explain different types of cyber attacks. (OR)  
 b) explain detail about parts of loop?  
 38. a) What are the advantages and disadvantages of OOPs? (OR)  
 b) Explain the different types of inheritance? (FP – I)



**MOUNT CARMEL MISSION MATRIC HIGHER SECONDARY SCHOOL – KALLAKURICHI****FULL PORTION TEST – I – 2023 – 2024****STD: XI****COMPUTER SCIENCE****LESSON: 1 to 18****TIME: 3 : 00 Hrs****MARKS: 70****PART – I****I. CHOOSE THE CORRECT ANSWER:****15 X 1 = 15**

1. b) Plotter
2. b)  $10^3$
3. c) Decoder
4. a)  $F_2$
5. a) Micro corporations
6. c) C with classes
7. d) \n
8. a) one
9. d) ::
10. b) control statement
11. a) Inheritance
12. b) void fun (intx);  
void fun (inty);
13. c) pharming
14. c) Inherited class
15. a) 17 Feb 2001

**PART – II****II. ANSWER THE FOLLOWING QUESTIONS [ Any 6 ] Q.No: 24 IS COMPULSORY:****6 X 2 = 12****16. Distinguish between primary memory and secondary memory.****Ans:**

Primary Memory	Secondary Memory
i. Generally stores current files of OS and applications that are in use.	i. Generally stores data permanently.
ii. It holds data or instructions temporarily.	ii. It stores data permanently.
iii. It is volatile memory.	iii. It is non-volatile memory.
iv. Eg: RAM (Random Access Memory)	iv. Eg: CD, DVD, Pen Drive etc.,

**17. What is program counter?**

**Ans:** The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be executed.

**18. Differentiate save and save as option.****Ans:**

Save	Save As
i. Save option is normally used to update the last saved file.	i. Save As option is used to store the file in new location with new or same file name.
ii. Allows to give new filename and location of file only first time.	ii. Allows to save file with new name at new location every time.
iii. Shortcut key for save: ctrl + s	iii. Shortcut key for save as: f12 key

**19. How do we refine a statement?**

**Ans:** After decomposing a problem into smaller subproblems, each subproblems can be expanded into more detailed steps. Each step can be further expanded to still more steps, and so on. This known as refinement.

**20. Define loop invariant with an example.**

**Ans:** In iteration, the loop body is repeatedly executed as long as the loop condition is true. Each time the loop body is executed, the variables are updated. However, there is also a property of the variables which remains unchanged by the execution of the loop body. This unchanging property is called the loop invariant. Loop invariant is the key to construct and to reason about iterative algorithms.

**21. What is polymorphism?**

**Ans:** Polymorphism is the ability of a message or function to be displayed in more than one form. In C++, polymorphism is achieved through function overloading and operator overloading.

**22. Write the rules for function overloading.**

**Ans:**

- The overloaded function must differ in the number of its arguments or data types.
- The return type of overloaded functions are not considered for overloading same data type.
- The default arguments of overloaded functions are not considered as part of the parameter list in function overloading.

**23. List out the methods of invoking constructors with an example.**

**Ans:** There are two ways to create an object using parameterized constructor

- Implicit call
- Explicit call

**Implicit call:** In this method, the parameterized constructor is invoked automatically whenever an object is created. For example simple `s1(10,20);` in this for creating the object `s1` parameterized constructor is automatically invoked.

**Explicit call:** In this method, the name of the constructor is explicitly given to invoke the parameterized constructor so that the object can be created and initialized. For example simple `s1=simple(10,20); //explicit call`

Explicit call method is the most suitable method as it creates a temporary object, the chance of data loss will not arise. A temporary object lives in memory as long as it is being used in an expression. After this it gets destroyed.

**24. Write the output of the following code:**

```
#include<iostream>
int main( )
{
    double var1=87.25255;
    cout<<(float)var1<<endl;
    cout<<(int)var1<<endl;
}
```

**Ans:**

87.2525  
87

**PART – III****III. ANSWER THE FOLLOWING QUESTIONS [ Any 6 ] Q.No: 33 IS COMPULSORY: 6 X 3 = 18****25. What is the significant of monitor?****Ans:**

- Monitor is the most commonly used output device to display the information.
- Pictures on a monitor are formed with picture elements called PIXELS.
- Monitors may either be Monochrome which display text or images in Black and White or can be color, which display results in multiple colors.
- There are many types of monitors available such as CRT (Cathode Ray Tube), LCD (Liquid Crystal Display) and LED(Light Emitting Diodes).
- The monitor works with the VGA(Video Graphics Array) card. The video graphics card helps the keyboard to communicate with the screen. It acts as an interface between the computer and display monitor.

**26. Differentiate computer Organisation from computer Architecture.****Ans:**

Computer Organisation	Computer Architecture
i. Computer organisation is concerned with how the various components of computer hardware operate.	i. Computer architecture deals with the engineering considerations involved in designing a computer.
ii. Computer organisation deals with the hardware components that are transparent to the programmer.	ii. Computer architecture is concerned with how various hardware components are designed.

**27. List out the prominent operating system.****Ans:** Prominent OS are as follows:

- UNIX
- Microsoft Windows
- Linux
- iOS
- Android

Modern operating systems use a Graphical User Interface (GUI). A GUI lets use to your mouse to click icons, buttons, menus and everything, is clearly displayed on the screen using a combination of graphics and text elements.

**28. What is called My Computer with give an example.**

**Ans:** By clicking this icon, the user can see the disk drivers mounted in the system. In windows XP, Vista, this icon is called "My computer" in Windows 8 and 10, it is called "This PC".

**29. Define a function to double a number in two different ways: (1)  $n+n$  (2)  $2 \times n$**

**Ans:**

(1) Double (n)

-- inputs: n is a real number or an integer,  $n > 0$

-- Outputs: y is a real number or an integer such that  $y = n + n$

(2) Double (n)

-- inputs: n is a real number or an integer,  $n > 0$

-- Outputs: y is a real number or an integer such that  $y = 2 \times n$

**30. Write a C++ program to display number from 1 to 10.**

**Except 5 using 'for' and 'continue' statement.**

**Ans:** #include <iostream>

using namespace std;

int main( )

{

cout << "Numbers from 1 to 10 (excluding 5):" << endl;

for (int i = 1; i <= 10; ++i)

{

if (i == 5)

{

// Skip the number 5 using the continue statement

continue;

}

cout << i << " ";

}

cout << endl;

return 0;

}

**31. Why is main function special?**

**Ans:** The main( ) function is the starting point where all C++ programs begin their execution. A C++ program is a collection of functions. The main( ) function is the starting point of program execution. So, every C++ program must have a main function.

**Example:**

int main( ) // ← Starting point of execution

{

cout << "This is an main";

}

**32. Discuss the benefits of constructor overloading.**

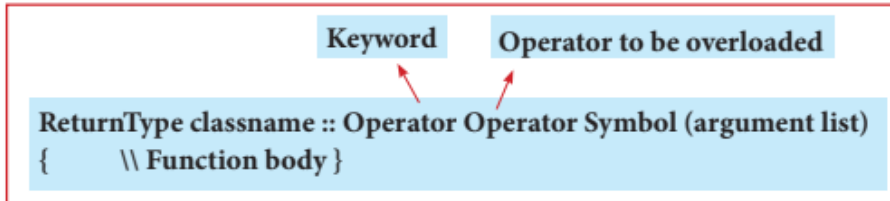
**Ans:**

- A class can have more than one constructor with different signature.
- Constructor overloading provides flexibility of creating multiple type of objects for a class.

### 33. Write the syntax of operator overloading with an example.

Ans:

Operator Overloading Syntax



```

#include<iostream>
using namespace std;
class complex
{ int real,img;
  public:
  void read()
  {
    cout<<"\nEnter the REAL PART : ";
    cin>>real;
    cout<<"\nEnter the IMAGINARY PART : ";
    cin>>img;
  }
  complex operator +(complex c2)
  {
    complex c3;
    c3.real=real+c2.real;
    c3.img=img+c2.img;
    return c3;
  }
  void display()
  { cout<<real<<"+"<<img<<"i"; }
};
int main()
{
  complex c1,c2,c3;
  int choice, cont;
  cout<<"\n\nEnter the First Complex Number";
  c1.read();
  cout<<"\n\nEnter the Second Complex Number";
  c2.read();
  c3=c1+c2; // binary + overloaded
  cout<<"\n\nSUM = ";
  c3.display();
  return 0;
}
  
```

#### Output

```

Enter the First Complex Number
Enter the REAL PART : 3
Enter the IMAGINARY PART : 4
Enter the Second Complex Number
Enter the REAL PART : 5
Enter the IMAGINARY PART : 8
SUM = 8+12i
  
```

## PART – IV

## IV. ANSWER ALL THE QUESTIONS:

5 X 5 = 25

34. a) Explain the following: a) Inkjet Printer b) Multimedia Projector c) Bar code / QR code Reader

**Ans: a) Inkjet Printer:** Inkjet Printers use colour cartridges which combined Magenta, Yellow and Cyan inks to create color tones. A black cartridge is also used for monochrome output. Inkjet printers work by spraying ionised ink at a sheet of paper. The speed of Inkjet printers generally range from 1-20 PPM (Page Per Minute).



**Inkjet Printer**

**b) Multimedia Projector:** Multimedia projectors are used to produce computer output on a big screen. These are used to display presentations in meeting halls or in classrooms.



**Multimedia Projector**

**c) Bar code Reader:** Bar code is a pattern printed in lines of different thickness. The Bar code reader scans the information on the bar codes transmits to the Computer for further processing. The system gives fast and error free entry of information into the computer.

**QR (Quick Response) code:** The QR code is the two dimension bar code which can be read by a camera and processed to interpret the image.



**Bar code Reader**

( OR )



b) i) Write the procedure to convert Binary to Hexadecimal conversion.

ii) Convert the following Octal to Binary numbers a) 645 b) 145

**Ans: i) Procedure for convert Binary to Hexadecimal:**

Step 1: Group the given number into 4 bits from right to left.

Step 2: You can add preceding 0's to make a group of 4 bits if the left most group has less than 4 bits.

Step 3: Convert equivalent Hexadecimal value using "2's power positional weight method"

**Example**

Convert  $(1111010110)_2$  into Hexadecimal number

Step 1: Group the given number into 4 bits from right to left.

0011	1101	0110
------	------	------

**Note:** 0's are added to the left most group to make it a group of 4 bits

0011	1101	0110
$\underbrace{\hspace{1cm}}$	$\underbrace{\hspace{1cm}}$	$\underbrace{\hspace{1cm}}$
3	D	6
$(1111010110)_2 = (3D6)_{16}$		

**ii) Octal to Binary:**

a) 645

$\underbrace{\hspace{1cm}}_6$	$\underbrace{\hspace{1cm}}_4$	$\underbrace{\hspace{1cm}}_5$
110	100	101

$(645)_8 = (110100101)_2$

b) 145

$\underbrace{\hspace{1cm}}_1$	$\underbrace{\hspace{1cm}}_4$	$\underbrace{\hspace{1cm}}_5$
001	100	101

$(145)_8 = (001100101)_2$

**35. a) Explain the concept of a Distributed operating system along with its advantages.**

**Ans:** The Distributed Operating System is used to access shared data and files that reside in any machine around the world using internet/intranet. The users can access as if it is available on their own computer.

The advantages of distributed Operating System are as follows:

- A user at one location can make use of all the resources available at another location over the network.
- Many computer resources can be added easily in the network
- Improves the interaction with the customers and clients.
- Reduces the load on the host computer.



Distributed Operating Systems

## ( OR )

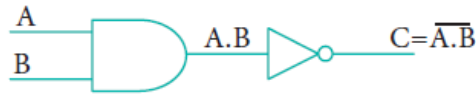
**b) Explain the Derived gates with expression and truth table.**

**Ans:** The logic gates like NAND, NOR, XOR and XNOR are derived gates which are derived from the fundamental gates AND, OR and NOT.

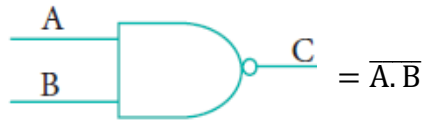
**i. NAND gate:** The NAND gate is the combination of NOT and AND. The NAND is generated by inverting the output of an AND operation.

**Logic function:**  $Y = \overline{A \cdot B}$

**Logic circuit:**



**Logic symbol:**



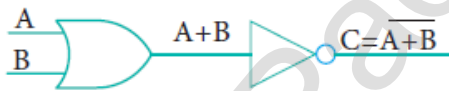
**Truth Table:**

Inputs		Outputs
A	B	$Y = \overline{A \cdot B}$
0	0	1
0	1	1
1	0	1
1	1	0

**ii. NOR gate:** The NOR gate is the combination of NOT and OR. The NOR is generated by inverting the output of an OR operation.

**Logic function:**  $Y = \overline{A + B}$

**Logic circuit:**



**Logic symbol:**

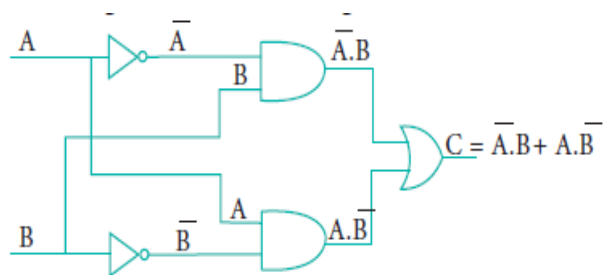


**Truth Table:**

Inputs		Outputs
A	B	$Y = \overline{A + B}$
0	0	1
0	1	0
1	0	0
1	1	0

**iii. XOR gate:** The XOR (exclusive – OR) gate acts in the same way as the logical “either/or”. The output is “true” if either, but not both, of the inputs are “true”.

Inputs	Outputs
Both inputs are same	FALSE (or) 0
Inputs are different	TRUE (or) 1

**Logic circuit:****Boolean function:**

$$C = A \bar{B} + \bar{A} B$$

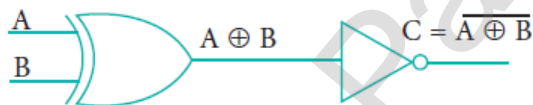
$$= A \oplus B$$

**Logical symbol:****Truth Table:**

Inputs		Outputs
A	B	$Y = A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0

**iv. XNOR gate:** The XNOR (exclusive – NOR) gate is a combination XOR gate followed by an inverter.

Its output is “true” if the inputs are the same, and “false” if the inputs are different. In simple words, the output is 1 if the input are the same, otherwise the output is 0.

**Logic circuit:****Boolean function of XNOR:**

$$C = \overline{A \oplus B}$$

$$= \overline{A.B + A.B}$$

$$= \overline{AB + \bar{A}\bar{B}}$$

**Logic symbol:****Truth Table:**

Inputs		Outputs
A	B	$Y = \overline{A \oplus B}$
0	0	1
0	1	0
1	0	0
1	1	1

36. a) Write the output of the following program.

```
#include<iostream>
using namespace std;
int main( )
{
    char dev[5][10] = {"Monitor", "Speaker", "Printer", "Scanner", "Keyboard"};
    for(int i=0; i<5; i++)
        cout<<dev[i]<<"\n";
}
```

Ans:

**OUTPUT:**

Monitor  
Speaker  
Printer  
Scanner  
Keyboard

( OR )

b) Explain call by value method with suitable example.

**Ans: Call by value method:** This method copies the value of an actual parameter into the formal parameter of the function. In this case, changes made to formal parameter within the function will have no effect on the actual parameter.

**Example:**

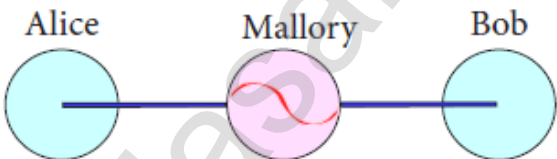
```
#include<iostream>
using namespace std;
void display(int x)
{
    int a=x*x;
    cout<<"\n\nThe Value inside display function (a * a):"<<a;
}
int main()
{
    int a;
    cout<<"\nExample : Function call by value:";
    cout<<"\n\nEnter the Value for A :";
    cin>>a;
    display(a);
    cout<<"\n\nThe Value inside main function "<<a;
    return(0);
}
```

**Output :**

Example : Function call by value  
Enter the Value for A : 5  
The Value inside display function (a \* a) : 25  
The Value inside main function 5



**37. a) Explain different types of cyber attacks.****Ans:**

Malware	Malware is a type of software designed through which the criminals gain illegal access.
Pharming	Pharming is a scamming practice in which malicious code is installed on a personal computer or server, misdirecting users to fraudulent web sites without their knowledge or permission. Pharming has been called " <b>phishing without a trap</b> ".
Phishing	Phishing is a type of computer crime used to attack, steal user data, including login name, password and credit card numbers. It occurs when an attacker targets a victim into opening an e-mail or an instant text message. The attacker uses phishing to distribute malicious links or attachments that can perform a variety of functions, including the extraction of sensitive login credentials from victims.
Man-in-the-middle attack (MITM)	<p>Man-in-the-middle attack (MITM; also Janus attack) is an attack where the attacker secretly relays and possibly alters the communication between two parties who believe they are directly communicating with each other.</p> <p><b>Example:</b> Suppose Alice wishes to communicate with Bob. Meanwhile, Mallory wishes to intercept the conversation to overhear and optionally to deliver a false message to Bob.</p> 

**( OR )****b) Explain detail about parts of loop?****Ans: Parts of a loop:** Every loop has four elements that are used for different purposes. These elements are

- Initialization expression
- Test expression
- Update expression
- The body of the loop

**Initialization expression(s):** The control variable(s) must be initialized before the control enters into loop. The initialization of the control variable takes place under the initialization expressions. The initialization expression is executed only once in the beginning of the loop.

**Test Expression:** The test expression is an expression or condition whose value decides whether the loop-body will be executed or not. If the expression evaluates to true (i.e., 1), the body of the loop gets executed, otherwise the loop is terminated.

In an entry-controlled loop, the test-expression is evaluated before the entering into a loop whereas in an exit-controlled loop, the test-expression is evaluated before exit from the loop.

**Update expression:** It is used to change the value of the loop variable. This statement is executed at the end of the loop after the body of the loop is executed.

**The body of the loop:** A statement or set of statements forms a body of the loop that are executed repetitively. In an entry-controlled loop, first the test-expression is evaluated and if it is nonzero, the body of the loop is executed otherwise the loop is terminated. In an exit-controlled loop, the body of the loop is executed first then the test-expression is evaluated. If the test-expression is true the body of the loop is repeated otherwise loop is terminated.

**38. a) What are the advantages and disadvantages of OOPs?****Ans: Advantages of OOP:****- Re-usability:**

“Write once and use it multiple times” you can achieve this by using class.

**- Redundancy:**

Inheritance is the good feature for data redundancy. If you need a same functionality in multiple class you can write a common class for the same functionality and inherit that class to sub class.

**- Easy Maintenance:**

It is easy to maintain and modify existing code as new objects can be created with small differences to existing ones.

**- Security:**

Using data hiding and abstraction only necessary data will be provided thus maintains the security of data.

**Disadvantages of OOP****- Size:**

Object Oriented Programs are much larger than other programs.

**- Effort:**

Object Oriented Programs require a lot of work to create.

**- Speed:**

Object Oriented Programs are slower than other programs, because of their size.

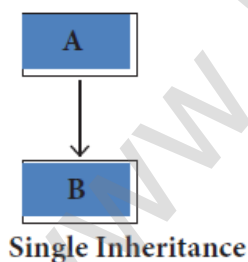
( OR )

**b) Explain the different types of inheritance?**

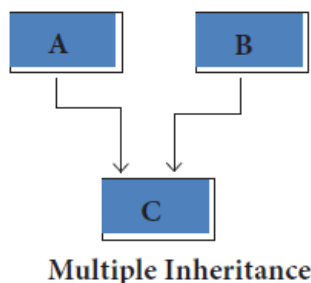
**Ans:** Inheritance is a process of creating new classes called derived classes, from the existing or base classes. There are different types of inheritance,

- i. Single inheritance
- ii. Multiple inheritance
- iii. Multilevel inheritance
- iv. Hybrid inheritance
- v. Hierarchical inheritance

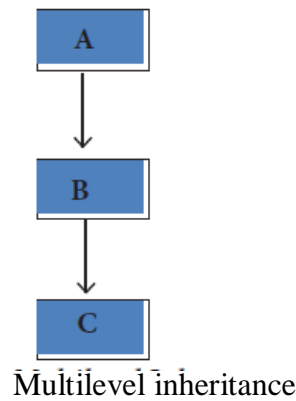
**i. Single Inheritance:** When a derived class inherits only from one base class, it is known as single inheritance.



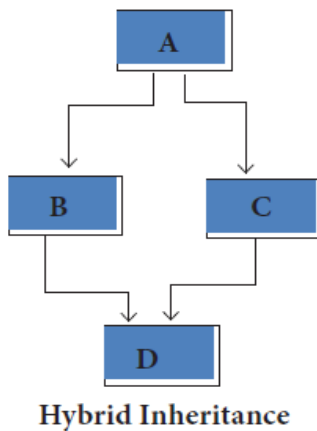
**ii. Multiple Inheritance:** When a derived class inherits from multiple base classes it is known as multiple inheritance.



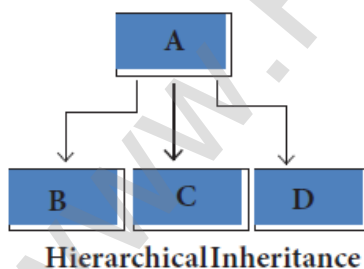
**iii. Multilevel Inheritance:** The transitive nature of inheritance is reflected by this form of inheritance. When a class is derived from a class which is a derived class – then it is referred to as multilevel inheritance.



**iv. Hybrid inheritance:** When there is a combination of more than one type of inheritance, it is known as hybrid inheritance. Hence, it may be a combination of Multilevel and Multiple inheritance or Hierarchical and Multilevel inheritance or Hierarchical, Multilevel and Multiple inheritance.



**v. Hierarchical inheritance:** When more than one derived classes are created from a single base class, it is known as Hierarchical inheritance.



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