STD: XI   **FULL PORTION TEST**
Time Allowed: 3.00 Hrs.   **COMPUTER SCIENCE**   Maximum Marks: 70
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

1. _____ is an easier approach to represent the signed numbers.
   a) signed magnitude representation   b) 1's complement
   c)2's complement   d) All of these

2. A+A=?
   a) A   b) 0   c) 1   d) AA

3. Which is the fastest memory?
   a) Hard disk   b) Main memory   c) Cache memory   d) Blue – Ray disc

4. Under which of the following OS, the option Shift+ Delete will permanently deletes a file
   or folder?
   a) Windows 7   b) MS-DOS   c) Linux   d) Android OS

5. How many times the loop is iterated?
         i : = 0
   While i ≠ 5
         i:=i+1
   a) 4   b) 5   c) 6   d)0

6. If m x a + n x b is an invariant for the assignment a,b : a+8,b+7, the values of m and n are
   a) m=8,n=7   b) m=7,n= -8   c) m=7,n=8   d) m=8,n=-7

7. Who coined C++?
   a) Rick Mascitti   b) Risk Bjarne   c) Bill Gates   d) Dennis Ritchie

8. The multi way branch statement:
   a) if   b) if .....else   c) Switch   d) for

9. Find the odd one out.   a) strlwr( )   b) sqrt( )   c) strupr( )   d) strlen( )

10. What will happen when the structure is declared?
   a) it will not allocate any memory.   b) it will allocate the memory.
   c)it will be declared and initialized   d) it will be only declared.

11. The encapsulation of data from direct access by the program is called_____
   a) Data hiding   b) information hiding   c) variable hiding   d) Both A and B

12. Which of the following access specifies protects data from inadvertent modifications?
   a) private   b) protected   c) public   d) global

13. The_____ cannot have Default arguments values
   a) operator overloaded   b) function overloaded
   c) methods   d) function

14. The type of inheritance the reflects the transitive nature is?
   a) single inheritance   b) multiple inheritance
   c) multilevel inheritance   d) hybrid inheritance

15. A computer ethics is set of moral principles that regulate the use of computer by_____
    a) Machine   b) user   c) programmer   d) developer

PART – II

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

16. What is the function of an ALU?

17. What are the parameters which influence the characteristics of a microprocessor?

18. What are called standard icons?

19. Both conditional statement and interactive statements have a conditions and a statement. How do they differ?

20. What are modifiers? What is the use of modifiers?

21. Write the syntax of the alternative to if –else statement with an example.

22. What is the syntax to declare two dimensional arrays?

23. What is function overloading?

24. Write an one example of while loop variation an infinite loop.

PART – III

Note: Answer any six questions. Question No. 33 is compulsory   6 X 3 = 18

25. Name any three output devices with an short note.

26. Perform the following Binary operations: i) 13+15   ii) 10+5   iii) 15+20

27. Write down the classifications microprocessors based on the instruction set.

28. Differentiate copy and move its short cut keys.

29. Define an access specifiers and list out its types.

30. Describe the differences between keywords and identifies.

31. What are arithmetic operators in C++? Differentatiate unary and binary arithmetic operators. Give example for each of them.

32. Covert the following if-else to single conditional statement.

    If (x> =10)

    a=m+5;

    else

    a=m;

33. Write note an Array of strings and give an example.

PART – IV

Note: Answer all the questions   **5 X 5 = 25**

34. a) Write detail about booting of computer.

                     (OR)

   b) Find the 1's complement and 2's complement for the following decimal nmber.

       i) -65   ii) -46

35. a) List out the points to be noted while creating a user interface for an operating system.

                     (OR)

   b) Write the specifications of an algorithm hypotenuse whose inputs are the lengths of the two shorter sides of right angled triangle, and the output is the length of the third side.

36. a) explain different ways of finding a file or folder.

                     (OR)

   b) List out the various predefined function to explain detail about it.

37. a) Write about Binary operators used in C++.

                     (OR)

   b) Write a C++ program to add two distance using the following structure definition

     struct   Distance{

                        int feet;

                      float inch;

             } d_1, d_2, sum;

38. a) Explain detail about types of constructors and destructors with an example.

                     (OR)

   b) Debug the following C++ program.

    Output

    Constructor of base class....

    Constructor of derived....

    Constructor of derived1....

    Destructor of derived 1.....

    Destructor of derived......

    Destructor of base class...

    Program:

    $include <iostream>

    Using namespace std;

    Class base( )

    {

    Public

    Base( )

    {

    Cout<<" \n Constructor of base class....";

```
}
!base ( )
{
Cout<<"\n Destructor of base class....";
};
}
Class derived : : public base
{
Public
Derived( )
{
Cout"\n Constructor of derived....";
}
!derived( )
{
Cout<<"\n Destructor of derived...";
}
};
Class derived : : public derived
{
Public:
Derived1( )
{
Cout<<"\n constructor of derived1....";
}
Derived1( );
{
Cout<<"\n Destructor of derived 1...";
}
}
int main( )
{
Derived 1 x;
Return 0;
}
```

(FP – III)

PART – I

I. CHOOSE THE CORRECT ANSWER: 15 X 1 = 15

1. b) 1's complement
2. a) A
3. c) Cache memory
4. a) Windows 7
5. b) 5
6. b) m = 7, n = -8
7. a) Rick Mascitti
8. c) Switch
9. b) sqrt( )
10. d) it will be only declared
11. a) Data hiding
12. b) protected
13. a) operator overloaded
14. c) multilevel inheritance
15. b) user

PART – II

II. ANSWER Any 6 QUESTIONS. Q. No: 24 IS COMPULSORY: 6 X 2 = 12

16. What is the function of an ALU?

Ans: The ALU is a part of the CPU where various computing functions are performed on data. The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations. The result of an operation is stored in internal memory of CPU. The logical operations of ALU promote the decision-making ability of a computer.

17. What are the parameters which influence the characteristics of a microprocessor?

Ans: A Microprocessor's performance depends on the following characteristics:

a) Clock speed   b) Instruction set   c) Word size

18. What are called standard icons?

Ans: The icons which are available on desktop by default while installing Windows OS are called standard icons. The standard icons available in all Windows OS are My Computer, Documents and Recycle Bin.

19. Both conditional statement and interactive statements have a conditions and a statement. How do they differ?

Ans:

Conditional Statement	Iterative Statement
Condition is evaluated only once.	Condition is evaluated repeatedly until it becomes false.
Syntax: if C S Where C is a condition and S is a statement	**Syntax:** while C S Where C is a condition and S is a statement

Execution Style:
  i. Test whether C is true or false.
  ii. If C is true, then execute S, otherwise do nothing.
	Execution Style:
	  i. Test whether C is true or false.
	  ii. If C is true, then execute S, and go back to step I, otherwise do nothing.

| Example: www.Padasalai.Net
if a < b
result:=a | Example: www.Trb Tnpsc.com
While a >= 2
a:=a-2 |

20. What are the modifiers? What is the use of modifiers?

Ans: Modifiers can be used to modify (expand or reduce) the memory allocation of any fundamental data type. They are also called as Qualifiers.

There are four modifiers used in C++. They are:

1) signed   2) unsigned   3) long   4) short

21. Write the syntax of the alternative to if-else statement with an example.

Ans: The ?: Alternative to if- else

The conditional operator (or Ternary operator) is an alternative for 'if else statement'. The conditional operator that consists of two symbols (?:). It takes three arguments. The control flow of conditional operator is shown below:

The syntax of the conditional operator is:

expression 1? expression 2 : expression 3

FALSE

Expression1 (with Condition)   ?   Expression 2   :   Expression 3
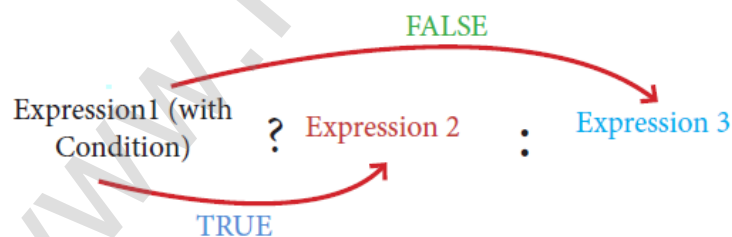
TRUE

In the above syntax, the expression 1 is a condition which is evaluated, if the condition is true (Non-zero), then the control is transferred to expression 2, otherwise, the control passes to expression 3.

Example: C++ Program to find the greatest of two numbers using conditional operator

```
#include <iostream>
using namespace std;
int main()
{
        int a, b, largest;
        cout << "\n Enter any two numbers: ";
        cin >> a >> b;
         largest = (a>b)? a : b;
        cout << "\n Largest number : " << largest;
        return 0;
}
```
Output:
```
 Enter any two numbers: 12 98
Largest number : 98
```

22. What is the syntax to declare two dimensional arrays?

Ans: The declaration of a 2-D array:

Syntax	Example
data-type array_name[row_size] [col_size]; data-type – Any valid C++ data type array_name – Name of the 2D array row_size – No. of rows col_size – No. of columns	int A[3] [4]; A – Name of the 2D array 3 – No .of rows 4 – No. of columns

23. What is function overloading?

Ans: The ability of the function to process the message or data in more than one form is called as function overloading. In other words function overloading means two or more functions in the same scope share the same name but their parameters are different.

24. Write an one example of while loop variation an infinite loop.

Ans:

A while loop may be infinite loop when no update statement is given inside the body of the loop. For example,

```
int main()
{

        int i = 0;
        while(i < =10)
             cout <<"The value of i is "<<i;  ────▶

             i++;  ────┐
                       │
        return 0;  ────▶

}
```

┌─────────────────────────────────┐
│ This statement will be displayed │
│ infinitely because no update │
│ statement inside the body of the loop │
└─────────────────────────────────┘

┌─────────────────────────────────┐
│ This is not a part of the while loop statement │
│ because of missing curly braces │
└─────────────────────────────────┘

PART – III

III. ANSWER Any 6 QUESTIONS. Q.No: 33 IS COMPULSORY: 6 X 3 = 18

25. Name any three output devices with an short note.

Ans: The Three frequently used Output devices are

   i) **Monitor:** Displays the output

   ii) **Printer:** Prints the output on paper

   iii) **Plotter:** Prints graphical output like printing building plans, flexes etc.

26. Perform the following Binary Operations. i) 13 + 15   ii) 10 + 5   iii) 15 + 20

Ans: i) 13 + 15

```
2 | 13                          2 | 15
2 | 6  – 1                      2 | 7  – 1
2 | 3  – 0                      2 | 3  – 1
    1  – 1                          1  – 1
```

13 = 1101   (1) (1) (1)   15 = 1111

```
        13 =  1    1    0   1
        14 =  1    1    1   1   ( + )
            1 1    0    0   0
```

┌──────────────────────┐
│ 13 + 15 = 11000 │
└──────────────────────┘

Decimal	Binary	Octal	Hexadecimal
0	0000	000	0000
1	0001	001	0001
2	0010	002	0002
3	0011	003	0003
4	0100	004	0004
5	0101	005	0005
6	0110	006	0006
7	0111	007	0007
8	1000	010	0008
9	1001	011	0009
10	1010	012	A
11	1011	013	B
12	1100	014	C
13	1101	015	D
14	1110	016	E
15	1111	017	F

```
2 |
2 | 10
2 |  5   – 0
  |  2   – 1
  |  1   – 0
```

```
2 | 5
2 | 2   – 1
  | 1   – 0
```

10 = 1010   5 = 101

```
10 = 1   0   1   0
 5 =     1   0   1   ( + )
     ————————————————
     1   1   1   1
```

$$\boxed{10 + 5 = 1111}$$

iii) 15 + 20

```
2 | 15
2 |  7   – 1
2 |  3   – 1
  |  1   – 1
```

```
2 | 20
2 | 10   – 0
2 |  5   – 0
2 |  2   – 1
  |  1   – 0
```

15 = 111

20 = 10100

```
    ①   ①
20 = 1   0   1   0   0
15 =     1   1   1   1   ( + )
     ————————————————————
     1 0 0   0   1   1
```

$$\boxed{15 + 20 = 100011}$$

27. Write down the classifications microprocessor based on the instruction set.

Ans: The two types of microprocessors based on their instruction sets.

    i. Reduced Instruction Set Computers (RICS)

      Examples: Intel P6, Pentium IV, AMD K6 and K7

    ii. Complex Instruction Set Computers (CISC)

      Examples: Intel 386 & 486, Pentium, Pentium II and III

28. Differentiate copy and move its short cut keys.

    Ans:

Copy	Move
When files are copied, they remain intact in original location	When files are moved, they are removed from the original location.
Copied files or folders will be available at both source and target locations	Moved files or folders will be available only at target location only
Shotcut to copy: Ctrl + C	Shortcut to move: Ctrl + X
Command: Edit ⟶ Copy	Command: Edit ⟶ Cut

29. Define an access specifiers and list out its types.

   Ans: They are 3 access specifiers

1. **The Public Members**
2. **The Private Members**
3. **The Protected Members**

1. **The Public Members:** A public member is accessible from anywhere outside the class but within a program. You can set and get the value of public data members even without using any member function.
2. **The Private Members:** A private member cannot be accessed from outside the class. Only the class member functions can access private members. By default all the members of a class would be private.
3. **The Protected Members:** A protected member is very similar to a private member but it provides one additional benefit that they can be accessed in child classes which are called derived classes (inherited classes).

30. Describe the differences between keywords and identifiers.

   Ans:

Keywords	Identifiers
Keywords are the reserved words.	Identifiers are the user-defined names.
Keywords are the essential elements to construct programs.	Identifers are the fundamental bulidings blocks of a program.
Most of the keywords are common to C, C++ and Java.	Every language has specific rules for naming the identifiers.
Examples: int, char, flaot, if etc	**Examples:** Variable ⟶ radius, area etc Arrays ⟶ a[5], boys[100] etc
A Keyword cannot be used as an identifier name	

31. What are arithmetic operators in C++? Differentiate unary and binary arithmetic operators.
   Give example for each of them.

Ans: Arithmetic operators perform simple arithmetic operations like addition, subtraction,
multiplication, division etc

Operator	Operation	Example
+	Addition	10 + 5 = 15
-	Subtraction	10 – 5 = 5
*	Multiplication	10 * 5 = 50
/	Division	10 / 5 = 2 (Quotient of the division)
%	Modulus (To find the remainder of a division)	10 % 3 = 1 (Remainder of the division)

Unary operators	Binary opeartors
Unary operators require only one operand for the operation.	Binary operators require two operands for the operation.
The order of precedence of unary operators is higher.	The order of precedence of binary operators is lower compared to Unary operators
Examples:	**Examples:**
++ --	+ - * / %

32. Convert the following if-else to single conditional statement.

if (x > = 10)

a = m + 5;

else

a = m;

Ans:

> a = (x > = 10) ? m + 5 : m;

33. Write note an Array of strings and give an example.

Ans: An array of strings is a two-dimensional character array. The size of the first index (rows) denotes the number of strings and the size of the second index (columns) denotes the maximum length of each string. Usually, array of strings are declared in such a way to accommodate the null character at the end of each string.

For example, the 2-D array has the declaration:

char Name[6][10];

In the above declaration, the 2-D array has two indices which refer to the row size and column size, that is 6 refers to the number of rows and 10 refers to the number of columns.

34. a) Write detail about booting of computer.

Ans: An Operating system (OS) is a basic software that makes the computer to work. When a computer is switched on, there is no information in its RAM. At the same time, in ROM, the pre-written program called POST (Power on Self Test) will be executed first. This program checks if the devices like RAM, keyboard, etc., are connected properly and ready to operate. If these devices are ready, then the BIOS (Basic Input Output System) gets executed. This process is called Booting. Thereafter, a program called "Bootstrap Loader" transfers OS from hard disk into main memory. Now the OS gets loaded (Windows/Linux, etc.,) and will get executed. Booting process is of two types.

    1) Cold Booting

    2) Warm Booting

1) Cold Booting: When the system starts from initial state i.e. it is switched on, we call it cold booting or Hard Booting. When the user presses the Power button, the instructions are read from the ROM to initiate the booting process.

2) Warm Booting: When the system restarts or when Reset button is pressed, we call it Warm Booting or Soft Booting. The system does not start from initial state and so all diagnostic tests need not be carried out in this case. There are chances of data loss and system damage as the data might not have been stored properly.

[OR]

b) Find the 1's complement and 2's complement for the following decimal number.

    i) – 65   **ii) – 46**

Ans:

  i) – 65

```
2 | 65
2 | 32   – 1
2 | 16   – 0
2 |  8   – 0
2 |  4   – 0
2 |  2   – 0
      1   – 0
```

$$(- 65)_{10} = (1000001)_2$$

$$(- 65) = 1\ 0\ 0\ 0\ 0\ 0\ 1$$

1's Complement $(- 65) = 0\ 1\ 1\ 1\ 1\ 1\ 0$

2's Complement $= 1\ (+)$

$$ 0\ 1\ 1\ 1\ 1\ 1\ 1$$

$$(- 65)_{10} = (0\ 1\ 1\ 1\ 1\ 1\ 1)_2$$

```
2 | 46
2 | 23  – 0
2 | 11  – 1
2 |  5  – 1
2 |  2  – 1
2 |  1  – 0
```

$(-46) = 1\ 0\ 1\ 1\ 1\ 0$ ①

1's Complement $(-46) = 0\ 1\ 0\ 0\ 0\ 1$

2's Complement $=$ $1\ (+)$

     $0\ 1\ 0\ 0\ 1\ 0$

$(-46)_{10} = (\ 0\ 1\ 0\ 0\ 1\ 0\ )_2$

35. a) List out the points to be noted while creating a user interface for an operating system.

 Ans: Points to be considered while designing an User Interface.

  i) The user interface should enable the user to retain this expertise for a longer time.

  ii) The user interface should also satisfy the customer based on their needs.

  iii) The user interface should save user's precious time.

  iv) The ultimate aim of any product is to satisfy the customer. The User Interface is also to satisfy the customer.

  v) The user interface should reduce number of errors committed by the user.

   [OR]

 b) Write the specification of an algorithm hypotenuse whose inputs are the lengths of the two shorter sides of a right – angled triangle, and the output is the length of the third side.

  Ans:

   Point to consider

   - a, b and h are sides of a triangle, therefore a, b and h are positive.

   hypotenuse(a, b)

   - - inputs: a, b are real numbers, a>0, b>0

   - - outputs: h is real number, h>0 where $h^2 = a^2 + b^2$

36. a) Explain different ways of finding a file or folder.

 Ans: To find a file or folder:

  i. Click the **start** button, the **search** box appears at the bottom of the start menu.

  ii. Type the name of the file or the folder or part of it to search.

  iii. The files or the folders with the specified names will appear, if you click that file, it will directly open that file or the folder.

  iv. There is another option called **"See more results"** which appears above the **search** box.

  v. If you click it, it will lead you to a **Search Results** dialog box where you can click and open that file or the folder.

  Searching Files or Folders using Computer icon:

  i. Click **Computer Icon** from desktop or from **Start menu**.

  ii. The Computer disk drive screen will appear and at the top right corner of that screen, there is a **search box** option.

  iii. Type the name of the file or the folder or part of it to search.

  iv. Just click and open that file or the folder.

  [OR]

 b) List out the various predefined function to explain detail about it.

Ans: - C++ provides a rich collection of functions ready to be used for various tasks. The tasks to be performed by each of these are already written, debugged and compiled, their definitions alone are grouped and stored in files called **header files**. Such ready-to-use sub programs are called **pre-defined functions or built-in functions.**

- C++ also provides the facility to create new functions for specific task as per user requirement. The name of the task and data required (arguments) are decided by the user and hence they are known as **User-defined functions.**

- **C++ Header Files andBuilt-in Functions**

Header files provide function prototype and definitions for library functions. Data types and constants used with the library functions are also defined in them. A header file can be identified by their file extension **.h.** A single header file may contain multiple built-in functions. For example: **stdio.h** is a header file that contains pre-defined **"standard input/output"** functions.

- Standard input/output (stdio.h)

This header file defines the standard I/O predefined functions **getchar(), putchar(), gets(), puts()** and etc.

1. **getchar() and putchar() functions**

The predefined function **getchar()** is used to get a single character from keyboard and **putchar()** function is used to display it.

C++ code to accept a character and display it

```
#include<iostream>
#include<stdio.h>
using namespace std;
int main()
{
        cout<<"\n Type a Character : ";
        char ch = getchar();
        cout << "\n The entered Character is: ";
        putchar(ch);
        return 0;

}
Output:
Type a Character : T
The entered Character is: T
```

2. **gets() and puts() functions**

Function gets() reads a string from standard input and stores it into the string pointed by the variable. Function **puts()** prints the string read by **gets()** function in a newline.

C++ code to accept and display a string

```
#include<iostream>
#include<stdio.h>
using namespace std;
int main()
{
        char str[50];
        cout<<"Enter a string : ";
        gets(str);
        cout<<"You entered: "
        puts(str);
        return(0);
}
```

Output :

Enter a string : Computer Science

You entered: Computer Science

- **Character functions (ctype.h)**

   This header file defines various operations on characters. Following are the various character functions available in C++. The header file **ctype.h** is to be included to use these functions in a program.

   1. **isalnum()**

      This function is used to check whether a character is **alphanumeric or not**. This function returns non-zero value if c is a digit or a letter, else it returns 0.

      General Form:

          int isalnum (char c)

      Example :

      int r = isalnum('5');

      cout << isalnum('A') <<'\t'<<r;

      But the statements given below assign 0 to the variable n, since the given character is neither an alphabet nor a digit.

      char c = '$';

      int n = isalnum(c);

      cout<<c;

      Output:

       0

```
#include<iostream>
#include<stdio.h>
#include<ctype.h>
using namespace std;
int main()
{
        char ch;
        int r;
        cout<<"\n Type a Character :";
        ch = getchar();
        r = isalnum(ch);
        cout<<"\nThe Return Value of isalnum(ch) is :"<<r;
}
```

Output-1:

    Type a Character :A

    The Return Value of isalnum(ch) is :1

Output-2:

    Type a Character :?

    The Return Value of isalnum(ch) is :0

   2. **isalpha()**

The isalpha() function is used to check whether the given character is an alphabet or not.

General Form:

   isalpha(char c)

This function will return 1 if the given character is an alphabet, and 0 otherwise 0. The following statement assigns 0 to the variable n, since the given character is not an alphabet.

int n = isalpha('3');

But, the statement given below displays 1, since the given character is an alphabet.

cout << isalpha('a');

Program 11.4

```
#include<iostream>
#include<stdio.h>
#include<ctype.h>
using namespace std;
int main()
{
        char ch;
        cout << "\n Enter a charater: ";
        ch = getchar();
        cout<<"\n The Return Value of isalpha(ch) is :" << isalpha(ch) ;
}
```

Output-1:

     Enter a charater: A

     The Return Value of isalpha(ch) is :1

Output-2:

     Enter a charater: 7

     The Return Value of isalpha(ch) is :0

---

3. isdigit()

This function is used to check whether a given character is a digit or not. This function will return 1 if the given character is a digit, and 0 otherwise.

General Form:

   isdigit(char c)

```
using namespace std;
#include<iostream>
#include<ctype.h>
int main()
{
        char ch;
        cout << "\n Enter a Character: ";
        cin >> ch;
        cout<<"\n The Return Value of isdigit(ch) is :" << isdigit(ch) ;

}
```

Enter a Character: 3
The Return Value of isdigit(ch) is :1

Output-2

Enter a Character: A
The Return Value of isdigit(ch) is :0

*Return 0; (Not Compulsory in latest compilers)

4. **islower()**

   This function is used to check whether a character is in lower case (small letter) or not. This functions will return a non-zero value, if the given character is a lower case alphabet, and 0 otherwise.

   General Form:

   islower(char c)

   After executing the following statements, the value of the variable **n** will be **1** since the given character is in lower case.

   char ch = 'n';

   int n = islower(ch);

   But the statement given below will assign 0 to the variable n, since the given character is an uppercase alphabet.

   int n = islower('P');

5. **isupper()**

   This function is used to check the given character is uppercase. This function will return 1 if true otherwise 0.

   General Form:

   isupper(char c)

   For the following examples value **1** will be assigned to **n** and **0** for m.

   int n=isupper('A');

   int m=isupper('a');

6. **toupper()**

   This function is used to convert the given character into its uppercase. This function will return the upper case equivalent of the given character. If the given character itself is in upper case, the output will be the same.

   General Form:

   char toupper(char c);

   The following statement will assign the character constant **'K'** to the variable c. **char c = toupper('k');**

   But, the output of the statement given below will be **'B'** itself. **cout <<toupper('B');**

7. **tolower()**

   This function is used to convert the given character into its lowercase. This function will return the lower case equivalent of the given character. If the given character itself is in lower case, the output will be the same.

   General Form:

   char tolower(char c)

   The following statement will assign the character constant '**k**' to the variable c.

   char c = tolower('K');

   But, the output of the statement given below will be **'b'** itself.

   cout <<tolower('b');

37. a) Write about Binary operators used in C++.

Ans: - Binary operators require two operands.

- Binary operators are grouped as

Arithmetic operators	+ - * / %
Relational operators	< <= > >= == !=
Logical operators	&& || !
Assignment operators	+= -= *= /= &=
Conditional operator (Ternary Operator)	? :

i. **Arithmetic Operators:**

Operator	Operation	Example
+	Addition	12 + 4 = 16
-	Subtraction	12 – 4 = 8
*	Multiplication	12 * 4 = 48
/	Division	12 / 4 = 3
%	Modulus (Gives our remainder of division)	12 % 2 = 0

ii. **Relational Operators:**

Operator	Operation	Example
<	Less than	12 < 4 is FALSE
< =	Less than or equal to	12 < = 12 is TRUE
>	Greater than	12 > 4 is TRUE
> =	Greater than or equal to	12 > = 12 is TRUE
= =	Equal to	12 = = 4 is FALSE
! =	Not equal to	12 ! = is TRUE

iii. **Logical Operators:**

Operator	Operation	Description	Example
&&	AND	The logical AND combines two different relational expressions into one. Both Expressions are TRUE Returns TRUE otherwise returns FALSE	(80 > 35) && (70 > 35) will return TRUE
||	OR	The logical OR combines two different relational expressions in to one. Any one expressions is TRUE returns TRUE otherwise returns FALSE	(80 > 35) || (70 > 35) will return TRUE
!	NOT	NOT works on a single expression / operand. Expression is TRUE returns FALSE expression is FALSE returns TRUE	! (80 > 35) will return FALSE

iv. **Assignment Operators:**

Operator	Name of the Operator	Example
=	Assignment	a = 5; b = a+2; // b will be 7
+ =	Addition assignment	a = 5; a+= 2; // a will be 7
- =	Subtraction assignment	a = 5; a- = 2; // a will be 3
*=	Multiplication assignment	a = 5; a* = 2; // a will be 10
/=	Division assignment	a = 6; a/=2; // a will be 3
%=	Modulo assignment	a = 5; a%=2; // a will be 1

v. **Conditional Operator (Ternary operator):**

Operator	Operation	Example
? :	Conditional operator	largest = (a>b)? a : b ;

[OR]

b) Write a C++ program to add two distance using the following structure definition
```
struct Distance
{
  int feet;
  float inch;
} d1, d2, sum;
```
Ans:
```
#include <iostream>
using namespace std;
struct Distance
{
   int feet;
   float inch;
 } d1,  d2,  sum;
int main( )
{
 cout<<" OBJECT d1: \n";
 cout<<" \n Enter Feet:";
 cin>>d1.feet;
 cout<<"\n Enter inch:";
 cin>>d1.inch;
 cout<<"\n OBJECT d2: \n";
 cout<<"\n Enter feet:";
 cin>>d2.feet;
 cout<<"\n Enter inch:";
 cin>>d2.inch;
 sum.feet = d1.feet + d2.feet;
 sum.inch = d1.inch + d2.inch;
 while (sum.inch > 12)
 {
  sum.inch- = 12;
  sum.feet++;
 }
}
```

```
cout<<"\n object d1: \n":
cout<<d1.feet<<" feet and" <<d1.inch<<"inches \n";
cout<<"\n object d2: \n";
cout<<d2.feet<<" feet and" <<d2.inch<<"inches \n";
cout<<"\n object sum: \n";
cout<<sum.feet<<"feet and"<<sum.inch<<"inches\n";
cin.get( );
cin.get( );
return 0;
}
```

38. a) Explain detail about types of constructors and destructors with an example.

Ans: There are different types of constructors.

- Default Constructors

A constructor that accepts no parameter is called default constructor. For example in the class Data, Data ::Data() is the default constructor . Using this constructor Objects are created similar to the way the variables of other data types are created. If a class does not contain an explicit constructor (user defined constructor) the compiler automatically generate a default constructor.

- Parameterized Constructors

A constructor which can take arguments is called parameterized constructor .This type of constructor helps to create objects with different initial values. This is achieved by passing parameters to the function.

Example:

Data :: Data(int,int);

- Copy Constructors

A constructor having a reference to an already existing object of its own class is called copy constructor. It is usually of the form Data (Data&), where Data is the class name.

A copy constructor can be called in meny ways:

1) When an object is passed as a parameter to any of the member functions
   Example void Data::putdata(Data x);
2) When a member function returns an object
   Example Data getdata() { }
3) When an object is passed by reference to an instance of its own class
   For example, Data d1, d2 (d1); // d2(d1) calls copy constructor

Example: Types of constructor

```
#include<iostream>
using namespace std;
class Data
{
    int i, j;
  public:
    int k;
    Data()
    {
        cout<<"Non Parametrerized constructor";
        i=0;
         j=0'
    }
    Data(int a,int b)
    {
        cout<<"Parametrerized constructor";
        i=a;
         j=b'
    }
    Data(Data &a)
    {
        cout<<"Copy constructor";
        i=a.i;
         j=b.j'
    }

    void display()          //member function
    {
      cout<< i<<j;
    }
};
int main()
{
      Data  d1,d2(10,20),d3(d2);
      d1.display();
      d2.display();
      d3.display();
       return 0;

}
```

- Destructors

When a class object goes out of scope, a special function called the *destructor* gets executed. The destructor has the same name as the class tag but prefixed with a **~(tilde)**.Destructor function also return nothing and it does not associated with anydata type.

Example:

```
#include<iostream>
using namespace std;
class simple
{
private:
int a, b;
public:
simple()
{
a= 0 ;
b= 0;
cout<< "\n Constructor of class-simple ";
}
void getdata()
{
cout<<"\n Enter values for a and b ";
cin>>a>>b;
}
void putdata()
{
cout<<"\nThe two integers are .. ";
cout<<<<a<<'\t'<< b<<endl;
cout<<"\n The sum = "<<a+b;
}
~simple()
{   cout<<"\n Destructor is executed ";}
};
int main()
{
simple s;
s.getdata();
s.putdata();
return 0;
}
```

```
Output:
Constructor of class-simple
Enter values for a and b  6 7
The two integers are .. 6      7
The sum = 13
Destructor is executed
```

    [OR]
  b) Debug the following C++ program.
   Output
   Constructor of base class...
   Constructor of derived ...
   Constructor of derived1 ...
   Destructor of derived1 ...
   Destructor of derived ...
   Destructor of base class....

PROGRAM

```
$include<iostream>
using namespace std;
class base( )
{
public
base()
{
cout<<"\n Constructor of base class...";
}
!base()
{
 cout<<"\nDestructor of base class.... ";
 }
 };
 class derived :: public base
{
 public :
 derived()
{
 cout << "\nConstructor of derived ...";
 }
 !derived()
{
 cout << "\nDestructor of derived ...";
}
};
 class derived :: public derived
{
public :
derived1()
{
 cout << "\nConstructor of derived1 ...";
 }
 derived1( );
{
 cout << "\nDestructor of derived1 ...";
}
}
int main()
{
derived1 x;
return 0;
}
```

Ans:

Line No.	Error	Correction
1	$include <iostream>	#include<iostream>
3	class base( )	class base
5	public	public:
10	!base( )	~base( )
13	};	}
14	}	};
15	Class derived :: public base	class derived : public base
17	public	public:
22	!derived( )	~derived( )
27	Class derived1 :: public derived	class derived1 : public derived
30	derived1( );	derived1( )
34	derived1( );	~derived1( )
38	}	};

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