EXERCISE

Q1. Select the best answers for the following MCQs.

i. **Which of the following is ignored during program execution?**

a. Reserved words

b. Constant

c. Comment

d. Cont qualifier

ii. **What is the range of unsigned short integer?**

a. -214746848 to 2147483647

b. 0 to 4294967295

c. -327678 to 32767

d. 0 to 65535

iii. **In C++ the expression sum=sum+n can also be written as:**

a. sum+=n

b. sum=n++

c. sum=+n

d. n+=sum

iv. **Which of the following is equal to operator?**

a. &&

b. %

c. <=

d. ++

v. Which of the following operators is used to form compound condition?

a. &&
b. %
c. <=
d. ++

vi. Which of the following operators is used to form compound condition?

a. Arithmetic operator
b. Assignment operator
c. Relational operator
d. Logical operator

vii. The number of bytes reserved for a variable of data type 'float' is:

a. 2
b. 4
c. 6
d. 8

viii. How cursor is moved to the next tabular position for printing data?

a. By using reserved word
b. By using manipulator
c. By using escape sequence
d. By using header file

Answers:

i.	Comment	ii.	0 to 65535

iii.	Sum=+n	iv.	==
v.	%	vi.	Logical operator
vii.	4	viii.	By using escape sequence

SHORT QUESTIONS

Q2. Give short answers of the following questions

i. Define reserved words and give three examples

Answer

Reserved words

Reserved words are special words, which are reserved by a programming language for specific purpose in program. These cannot be used as a variable names. All the reserved words are written in lower case letters. There are about 80 reserved words in C++ but this may vary depending on the version being used

Examples

i. If

ii. Void

iii. Break

ii. What is the purpose of using header file in program?

Answer

When we want to use any function in our C++ program then first we need to import their definition from C++ library for importing their declaration and definition we

need to include header file in program by using #include. Header file include at the top of any C++ program.

Example

```
#include<iostream>

Using namespace std.

Int main()

{

Coat<< 'Hello, world'< end1;

Return0,

}
```

In above program print message on screen 'Hello world!' by using cout we but we do not define cout here actually already cout has been declared in a header file called iostream.

iii. State whether the following variable names are valid or invalid. State the reason for invalid variable names

a. Q123
b. _abcd
c. 5hml
d. Total
e. F3ss1
f. C$avg
g. Net_weight
h. Cout

Answer

a. A123	Valid variable
b. _abcd	Invalid variable
c. 5hml	Invalid variable
d. Total	Valid variable
e. F3ss1	Valid variable
f. C$avg	Invalid variable
g. Net_weight	Valid variable
h. Cout	Invalid variable

iv. Why escape sequence is used? Give three examples with explanation

Answer

Escape Sequences

Escape sequences are special characters used to control the output look on output devices. These characters are not printed. These are used inside the output statement

Examples

1. Suppose we want to print the following message on the screen

   Cout<< "there are many versions of";

   Cout<<"windows operating system";

   When the above two statements are executed the output will appear on a single line as shown below

   There are many versions of Windows operating system

2. If it is desired to display the output in two lines then \n escape sequence can be used in various ways to move cursor to the beginning of next line

Cout<<"\nthere are many versions of":

Cout<<"nWindows operating system":

The following two statement can also obtain the same output

Cout<<"\nthere are many versions of\n":

Cout<<"Windows operating system":

A single output statement can also be used

Cout<<"\nThere are many versions of \nWindows operating system.":

3. The \t escape sequence can also be used to tab over eight characters as shown in the following statement

Cout<<"C++\tis\ta\thigh\tlevel\tlanguage":

The output of this statement will be

C++ is a high level language

v. Differentiate between relational and logical operators

Answer

Difference

The difference between relational operators and logical operators is that relational operators can have any operand values and return Boolean while logical always have Boolean operands and return a Boolean Relational operators compare two values and produce a Boolean result.

vi. What will be the output of the following statements?

a. **Cout<<"17/3 is equal t "<<17/2;**

b. **Cout<<"10.0/4 is equal to"<<(40/5%3*7);**

Answer

Output of cout<<"17/3 is equal to "<<17/2;

17/3 is equal to 18

Output of cout<<"10.0/4 is equal to :<<10.24;

10.0/4 is equal to 2.55

Output of cout<<"40/5%3*7 is equal to "<<(40/5%3*7);

40/5%3*7 is equal to 14

vii. Evaluate the following integer expressions

a. 3+4*5

b. 4*5/10+8

c. 3*(2+7*4)

d. 20-2/6+3

e. (20-2)(6+3)

f. 25%7

Answer

a. **3+4*5**

3+4*5

3+20

23

b. **4*5/10+8**

4*5/10+8

20/10+8

2+8

10

c. **3*(2+7*4)**

3*(2+7+4)

3*(2+28)

3*30

90

d. **20-2/6+3**

20-0 22+3

23-0 22

22 78

e. **(20-2)/(6+3)**

(20-2)/(6+3)

18/9

2

f. **25%7**

25%7

4

viii. Evaluate the following expression that have integer and floating point data types

a. 10.0+15/2+4.3

b. 10.0+15.0/2+4.3

c. 4/6*3.0+6

d. 4/6*3.0+6

Answer

a. **10.0+15/2+4.3**

10.0+15/2+4.3

10.0+7.5+4.3

21.8

b. **10.0+15.0/2+4.3**

10.0+15.0/2+4.3

10.0+7.5+4.3

21.8

c. 4/6*3.0+6

4/6*3.0+6

0.67*3.0+6

2.01+6

8.01

ix. What will be the output of the following program?

```
#include <iostream.h>

#include <conio.h>

Void main ( )

{

Int num1, num2, total;

Num1=13;

Num2=20;

Total=num1+num2;

Cout<<"The total of "<<num1<<" and "<<num2<<" is "<<total<<end1;

Getch( ) ;

}
```

Answer

The total of 13 and 20 is 23

ix. What will be the output of the following program?

```
#include <iostream.h>

#include<conio.h>
```

```
Void main ( )
{
Int n;
N=10;
Cout<<"The initial value of n is "<<n<<end1;
Cout<<"The value of n is now "<<n<<end1;
Cout<<"The value of n is now "<<n<<end1;
N;
Cout<<"The value of n is now "<<n<<end1;
Getch( );
}
```

Answer

The initial value of n is 10

The value of n is now 10

The value of n is now 10

The value of n is now 9

EXTENSIVE QUESTIONS

Q1. Write long answers of the following questions

i. **Define variable and write the rules for specifying variable names**

Answer

Variables

A variable is a name of memory location where data is stored. Variables are used in computer program to store values of different data types. The data stored in a variable may change during program execution

Rules for Specifying Variable Names

The following are the rules for naming a variable

1. The first character of a variable name must be alphabet or underscore
2. The characters allowed in a variable name are

j. Underscore (_)

k. Digits (0 to 5)

l. Upper case letters (A to Z)

m. Lower case letters (a to z

Uppercase letters

An upper case letters is considered different from a lower case letters

Example

The variable **SUM** in different from **Sum** or **sum**

Underscore

The underscore (_) is generally used to improve readability

Example

The variable overtime may also be written as **over_time**

3. Special symbols such as $ @, %, # etc are not allowed
4. Blank spaces or comma is not allowed
5. Reserved words of C++ are not allowed to be used as a variable name

ii. Why type casting is used? Explain the types of type casting with an example of each type

Answer

Type casting

Type casting is used In C++ to convert data type from one type to another

Types of type casting

There are two types of type casting

i. Implicit type casting
j. Explicit type casting

i. **Implicit type casting**

Implicit type casting automatically converts a data type to another

Example

This is explained by the following example

Suppose variable q is declared as of type float and the following calculation is to be performed

q= 15/6;

Explanation

When this integer division is performed the result will also become an integer value 2 which will be implicitly converted to float g point value 2.0 and assigned to the variable q

If one or both of the integer constants are converted to floating point constant (14.0 or .0) this will perform division using floating point mathematics. In this case, the result produced will be 2.5 and it will be assigned to q

2. **Explicit type Casting**

In explicit type casting a special operator is used to convert one data type into another

General form

The general form for conversion is

(type) expression

Here expression can be an arithmetic expression or a variable

Example

This is explained by the following example

Suppose a and b are variables of type int and q is of type float. The integer value 15 is store a and 6 in b and the following division is to be performed

```
q=a/b;
```

Explanation

When this division is performed integer math will be used and the result produced will be 2, which will be assigned to the variable q

To obtain correct result, type casting should be used to convert at least one of the operands to type float as shown below

```
q= (float)a/b;
```

Now first the value stored in a will be converted to type float and then the division will be performed. The floating point math will be used and the correct result 2.5 will be produced which will be assigned to q

Similarly, the int type can also be used to convert a floating point value stored in a floating point variable into integer type by truncating the fractional part of the number

iii. Define endl and setw manipulator and give an example of each

Answer

The endl Manipulator

The endl manipulator has the same functions as the \n escape sequence. It causes a linefeed in the cout statement so that the subsequent text is displayed on the next line.

Program- Demonstrates the use of endl manipulator

```
#include <iostream.h>
#include <conio.h>
#include <iomanip.h>
Void main ( )
{
Cout<<"\nI am a student "<<end1;
Cout<<"I was born in 2001";
Getch( );
}
```

Output of the Program

The output of the program will be

I am a student

I was born in 2001

A single cout statement can also be used as shown below to obtain the same output

Cout<< "I am a student"<<end1<< I was born in 2001";

The setw Manipulator

The setw manipulator is used in output statement to set the minimum field width

General form

It has the general form

Setw(n)

Here n is an integer value that causes the number of text that follows to be printed within a field of n characters. The number of text is right justified within the set field width. It is commonly used in programs to align number or text on output.

Program- Demonstrates the use of setw manipulator

The following program demonstrates the use of setw manipulator in a program

```
#include <iostream.h>

#include <conio.h>

#include <iomanip.h>

Void main ( )

{

Int price1=8540, price2=325, price3=27800:

Cout<<"Product                "<<setw(10)  <<"Price"<<end1;

Cout<<"Hard disk              "<<setw(10)  <<"Price1"<<end1:

Cout<<"Mouse                  "<<setw(10)  <<"Price2"<<end1;

Cout<<"Computer               "<<setw(10)  <<"Price3"<<end1;

Getch ( );

}
```

The program will print the values following the setw manipulator within a field width of 10 characters and they will be right justified

Output of the Program

The output of the program is given below

```
Product          price

 Hard risk        8540

 Mouse             325

 Computer         27800
```

Program- Using a Single cout statement

The same program can also be written using a single cout statement as shown in the next program

```
#include <iostream.h>
#include <conio.h>
#include <iomanip.h>
Void main ( )
Int price1=8540, price2=325, price3=27800;
Cout<<"Product          "<<setw(10)  <<"Price"<<end1;
Cout<<"Hard disk        "<<setw(10)  <<"Price1"<<end1;
Cout<<"Mouse            "<<setw(10)  <<"Price2"<<end1;
<<"Computer             "<<setw(10)  <<"price3<<end1;
Getch( );
}
```

Output of the Program

If setw manipulator is not used, the output will be

Product	price
Hard disk	8540
Mouse	325
Computer	27800

iv. What is meant by precedence of operators? Write the operators with highest precedence at the top and the lowest at the bottom

Answer

Order of Precedence of operators

Order of precedence of operators describes the rules according to which operations are to be performed in an expression

In the following table, the operator that has the highest precedence is written at the top and the one with the lowest precedence is written at the bottom

Precedence	Operator	Description
1.	*, /, %	Multiplication, division and remainder
2.	+, -	Addition and subtraction
3.	<, <=, >, >=	Relational operators
4.	= =, !=	Equal to and not equal to
5.	!	Logical NOT
6	&&	Logical AND
7.	||	Logical OR
8.	=, *=, /=, %=, +=, -=	Assignment operator

LAB ACTIVITIES

Q1. Practice all the Example programs given in the chapter

Answer

Practical work

i. Write a program that reads four integers and prints their sum, product and average

Answer

Program

Answer

```
#include <iostream>

Int main ( )

{

Int num1, num2, num3, num4,                    //declaration

Std   cout<<"Input four integers":              //promt

Std   cin>>num1>>num2>>num3>>num4;   //input

std    cout>>"Sum of four numbers is="<<num1+num2+num3+num4<<std:end1;\

std    cout<<"Product of four numbers is="<<num1*num2*num3*num4 <<std:end1;

std    cout<<"Average of four numbers is="<<(num1+num2+num3+num4)/4<<std:end1;

return0:

}
```

ii. Write a program that reads length and breadth of a rectangle and prints its area

Answer

```
#include <iostream>

Int main ( )

{
```

```
Int length, breadth, area:
Std : : cout<<"Enter length of rectangle":
Std : : cin>>length'
Std : : cout<<"Enter breadth of rectangle":
Std : : cin>>breadth:
//Formula to calculate area of rectangle
Area=length*breadth:
Std : : cout<<"Area of rectangle << area:
Return 0:
}
```

iii. **Write a program that reads temperature in Fahrenheit and prints its equivalent temperature in Celsius using the following formula**

Answer

Program

```
#include <iostream>
Int main ( )
{
Int temp:
Std : : cout<<"Please enter the temperature in Fahrenheit";
Std : : cin>>temp:
Temp=(temp -32) /9.0*5.0:
Std : : cout <<temp <<"Temperature in Celsius:\n";
Return 0:
}
```