```
        sum = num1+num2+num3+num4+num5+num6;

        per = sum /100 ;

        cout<<"Sum = "<<sum;

        return 0;

    }
```

30. How do the type modifiers affect the size and range of int and char data types?

Ans. Type modifiers are the keywords used to alter the size, range or precision of data supported by the basic data types. Important modifiers are signed, unsigned, long and short. It alters the range of values by altering the memory size.

char data type has modifier as signed and unsigned

int data type has modifier as signed, unsigned, short and long.

**.

Chapter 7 - Control Statements in C++

1. Differentiate between switch and if .... else statement   **[March 2020, Score 3]**

Ans.

switch statement	if else statement
Evaluates conditions with equality operator only.	Evaluate any relational or logical expression.
Case constant must be an integer or a character type value.	Condition may include range of values and floating point constants.
When no match is found, default statement is executed.	When no expression evaluates to True, else block is executed.
break statement is required for exit from the switch statement.	Program control automatically goes out after the completion of a block.
More efficient when the same variable or expression is compared against a set of values for equality.	More flexible and versatile compared to switch.

2. Consider the following C++ code.   **[March 2020, Score 5]**

```
int x, sum;
sum = 0;
x=1;
while ( x < = 5 )
{ sum = sum + x ;
x++ ;
}
cout << sum;
```

a) Which is the loop control variable in above code

b) Write the four elements initialization, test expression, update statement and body of loop in the above code

c) Write the output of above code

Ans. a) x

   b) x=1; - initialization

   x<=5 – test expression

   x++; - update statements

   sum=sum+x;   - body of the loop

   c) 15 (1+2+3+4+5)

3. Consider the following C++ code   **[March 2020, Score 2]**

```
for ( i=1 i< = 10 ; ++i )
cout << i;
```

Rewrite the above code using while loop

Ans.

```
i=1;
while(i<=10)
{
cout<<i;
++i;
}
```

4. Briefly explain conditional operators in C++.   **[July 2019, Score 2]**

Ans. Conditional operator is an alternative to if else statement.

   Its general form is :

   Test expression ? True_case code : False_case code ;

   Conditional operator is a ternary operator.

5. Compare switch statement and else if ladder.   **[July 2019, Score 3]**

switch statement	if else statement
Evaluates conditions with equality operator only.	Evaluate any relational or logical expression.
Case constant must be an integer or a character type value.	Condition may include range of values and floating point constants.
When no match is found, default statement is executed.	When no expression evaluates to True, else block is executed.

6. Consider the following C++ code   **[July 2019, Score 3]**

```
int n=1;
while ( n<=10 )
{
cout<< n << " ";
++n;
}
```

a) Write the output of the code

b) Rewrite the above code using for loop

Ans. (a)1 2 3 4 5 6 7 8 9 10

(b)

```
for (n=1;n<=10;++n)
{
cout<< n << " ";
}
```

7. Rewrite the following code using switch case statement   **[March 2019, Score 2]**

```
if( lan == 'M' )
cout << " Malayalam ";
else if ( lan == 'E' )
cout<< " English ";
else
cout << " i prefer neither malayalam nor English ";
```

Ans. switch(lan)

```
{
case 'M': cout<<"Malayalam"; break;
case 'E': cout<<"English"; break;
default: cout<<"I prefer neither malayalam nor English";
```

```
}
```

8. Differentiate between entry-controlled loop and exit controlled loop.   **[March 2019, Score 3]**

Ans.

Entry controlled loop	Exit controlled loop
Initialisation before loop definition	Initialisation before loop definition
No guarantee to execute the loop body at least once	Will execute the loop body at least once even though the condition is False

9. Consider the following code

```
int i =1 ;
for( ; ; )
{
cout << i << "\n";
}
```

a) Find the output

b) Rewrite the code by using while loop with i < = 10 and i =i+2 in appropriate place for successful code execution.

[March 2019, Score 3]

Ans.

a) Prints 1 infinitely

b)
```
int i =1 ;
for( ;i<=10 ;i=i+2 )
    {
    cout << i << "\n";
    }
```

10. a) List the four components of a loop statements.

b) Write a C++ program to find the sum of numbers up to 100 by using any loop statement

[March 2019, Score 5]

Ans. a) Initialisation, test expression, Update statement and body of the loop.

b)
```
int main()
{
int n=1,s=0;
while (n<=100)
{
```

```
        s=s+n;
        n++;
    }
    cout<<"Sum is"<<s;
    }
```

11. Write a C++ program to find the simple interest of an amount (P) deposited with a rate of interest(R) for a period of years (N). Rate of interest = 7 % if deposit amount P is less than 1 lakh . Rate of interest = 8 % if deposit amount P is between 1 lakh and 5 lakh . Rate of interest = 9 % if deposit amount P is above 5 lakh . (hint : simple interest = P X N X R/100)   **[March 2018, Score 3]**

Ans.

```
    int main()
    {
    long int p,n,r;
    float i;
    cout<<"Enter the principal amount, no. of years";
    cin>>p>>n;

    if (p>=500000)
        r=9;
    else if (p>=100000)
        r=8;
    else
        r=7;

    i=p*n*r/100;
    cout<<"Interest is"<<i;
    }
```

12.   (a) Give the output of the following code

```
        for( i=10; i< 30; i +=3 )
        {
        cout<< i << "\t ";
        }
```

        b) Rewrite the code using while loop   **[March 2018, Score 3]**

Ans.   (a) 10 13   16   19   22   25   28

        (b) i=10;

```
            while(i<30)
            {
            cout<<i<<"\t";
```

```
            i+=3;
        }
```

13. Rewrite the following C++ statement using if else statement   **[July 2018, Score 2]**

cout<< result = mark > 30 ? " passed " : " failed ";

Ans. if(mark>30)

cout<<"passed";

else

cout<<"failed";

14. List four important elements of a loop.   **[July 2018, Score 2]**

Ans. initialisation

test expression

loop body

update statement

15. Write a C++ program to input a digit and print it in word   **[July 2018, Score 3]**

```
#include<iostream>
using namespace std;
int main ( )
{
        int dig ;
        cout<<"Enter a digit:";
        cin>>dig;
switch(dig)
{
case '0': cout<<"Zero"; break;
case '1': cout<<"One"; break ;
case '2': cout<<"Two"; break;
case '3': cout<<"Three"; break ;
case '4': cout<<"Four"; break;
case '5': cout<<"Five"; break ;
case '6': cout<<"Six"; break;
case '7': cout<<"Seven"; break ;
case '8': cout<<"Eight"; break;
case '9': cout<<"Nine"; break ;
default: cout<<"Invalid digit ";
}
```

16. Compare while loop and do while loop in C++   **[July 2018, Score 3]**

Ans.

while loop	do while loop
Entry controlled loop	Exit controlled loop
Initialisation before loop definition	Initialisation before loop definition
No guarantee to execute the loop body at least once	Will execute the loop body at least once even though the condition is False

17. There are three looping statements in c++.

     a) Which is the exit – controlled loop ?

     b) How does it differ from an entry controlled loop? **[July 2017, Score 3]**

Ans. a) do while

     b) In exit – controlled loop, the test expression is evaluated only after executing body of the loop.

18. Write a C++ program to input the amount of sales and calculate the discount amount based on the criteria given.

amount of sale   discount rate

25,000 and above   10%

10,000 and above but below 25000   7 %

below 10,000   no discount   **[July 2017, Score 5]**

<div align="center">OR</div>

Rewrite the following switch statement using if else if statement   **[July 2017, Score 5]**

```
switch (n)
{
        case 5: cout<< " Excellent " ; break;
        case 4 :
        case 3: cout << " Good " ; break ;
        case 2 : cout << " Average "; break;
        case 1 : cout << " Poor "; break;
        default : cout<<" invalid ";
}
```

Ans.

```
int main()
{
long int salesamt;
float discount;
```

```
cout<<"Enter the amount of sales";
cin>>salesamt;
if (salesamt>=25000)
        discount=salesamt*10/100;
else if (salesamt>=10000)
        discount=salesamt*7/100;
else
        discount=0;
cout<<"Discount is"<<discount;
}
```

OR

```
if(n==5)
        cout<<"Excellent";
else if (n==5) || (n==4)
        cout<<"Good";
else if (n==3)
        cout<<"Average";
else if(n==4)
        cout<<"Poor";
else
        cout<<"invalid";
```

19. for, while, do while are the three looping statements in C++. From these three loops, which loop will execute the loop body at least once even though the condition is false?.

a) for loop   b) while loop c) do while loop   d) do for loop   **[March 2017, Score 1]**

Ans. do while loop (exit controlled loop)

20. State whether the following statements are true or false. If false, give reason

[March 2017, Score 4]

a) break statement is essential in switch

b) for loop is an entry controlled loop

c) do .. while loop is an entry controlled loop

d) switch is a selection statement

Ans.   a) false

b) true

c) false

d) true

21. Rewrite the following code using if else ladder   **[March 2017, Score 5]**

```
int main ()
{
int colour;
cout << " Enter a number between 1 and 4 : " ;
cin >> colour ;
switch ( colour )
{
case 1:
cout << " Red " ;break;
case 2:
cout << "Green " ;break;
case 3:
cout << "Blue " ;break;
default :cout << " wrong input " ;
break;
}
```

<div align="center">

OR

</div>

Write a C++ program to find the biggest number from 3 given numbers.   **[March 2017, Score 5]**

Ans.

```
int main ()
{
int colour;
cout << " Enter a number between 1 and 4 : " ;
cin >> colour ;
if (colour==1)
        cout<<"Red";
else if(colour==2)
        cout<<"Green";
else if(colour==3)
        cout<<"Blue";
else
        cout<<"wrong input";
}
```

<div align="center">

OR

</div>

```
int main()
{
```

```
int a,b,c;
cout<<"Enter the three numbers";
cin>>a>>b>>c;
if(a>b) && (a>c)
        cout<<a<<"is biggest";
else if(b>c)
        cout<<b<<"is biggest";
else
        cout<<"c"<<is biggest";
}
```

22. Write out put of the following C++ program   **[July 2016, Score 1]**

```
int main()
{
int a, b , c ;
a = b = 1;
c =2;
if ( a + b > c )
cout << " \n RED ";
else if ( a + b < c )
cout << " \n Green ";
else
cout << " \n Blue ";
}
```

Ans. Blue (a+b=1+1=2, if(a+b>c) will become false, else if(a+b<c) become false)

23. Rewrite the following C++ statement using if… else   **[July 2016, Score 2]**

```
cout<<( n%2==0?"EVEN":"odd" );
```

Ans. if (n%2==0) cout<<"EVEN";
        else cout<<"ODD";

24. Explain the elements of a loop statement with suitable example   **[July 2016, Score 5]**

<p align="center">OR</p>

Write C++ program to print first 10 even natural numbers   **[July 2016, Score 5]**

Ans.

1. Initialisation: Before entering a loop, its control variable must be initialised. The initialisation statement is executed only once, at the beginning of the loop.

2. Test expression: I It decides whether the loop-body will be executed or not. If the test expression evaluates to True, the loop-body gets executed, otherwise it will not be executed.

3. Update statement: The update statement modifies the loop control variable by changing its value.

4. Body of the loop: The statements that need to be executed repeatedly constitute

the body of the loop.

As an example, a program code is given below :

```
i=10;
while(i<10)
{
cout<<i;
i=i+1;
}
```

Here the initialisation statement is i=1;

test expression is i<10

body of the loop is cout<<i;

update statement is i=i+1;

OR

```
int main()
{
int i,n=2;
for(i=1;i<=10;i++)
{
cout<<n;
n=n+2;
}
```

25. The following code segment prints first 10 natural numbers

```
int n = 1;
while ( n < = 10 )
{
cout<< n <<" ";
++n;
}
```

a) Modify the program to print first 100 natural numbers. **[March 2016, Score 1]**

b) Rewrite the above code using for loop **[March 2016, Score 2]**

Ans.

```
(a) int n = 1;
while ( n < = 100 )
{
cout<< n <<" ";
++n;
}
```

(b) for(n=1;n<=10;++n)

```
{
cout<<n<<" ";
}
```

26. Write a C++ program to check whether a given year is a leap year or not

[March 2016, Score 5]

Write a program to find sum of squares of first 10 odd numbers

Ans.

```
int main()
{
int year ;
cout << "Enter year (in 4-digits): ";
cin >> year;
if (year % 100 == 0)
        {
        if (year % 400 == 0)
                cout << "Leap Year\n" ;
        else
                cout<< "Not a leap year\n" ;
        }
else if (year % 4 == 0)
        cout << "Leap Year\n" ;
else
        cout<< "Not a leap year\n" ;
}
```

OR

```
int main()
{
int i,n=1,s=0;
for(i=1;i<=10;i++)
{
        s=s+n*n;
        n=n+1;
}
```

cout<<"The sum of squares is"<<s;

27. a) Correct the errors in the following program code to display numbers from 1 to 10.

[July 2015, Score 1]

```
for ( i=1; i > = 10 ; i++ )
cout >> i;
```

b) Explain the different types of programming errors with the help of above code.

Ans. a) for(i=1;i<=10;i++)

cout<<i;

b) Syntax error: Occurs due to violation of rules of programming writing >> with cout etc.

Logical error: Occurs due to incorrect logic like writing i>=10 in place of i< = 10.

28. Rewrite the following C++ code using if .. else statement   **[July 2015, Score 2]**

large = (n1 > n2) ? n1 " n2;

Ans. large=(n1>n2)?n1:n2;

29. Write the syntax of switch statement. Explain its working using an example

[July 2015, Score 5]

OR

Compare the working of do .. while loop and while loop using an example

Ans. switch(test_variable)
```
{
case case_value1:
        statement;
        break;
case case_value2:
        statement;
        break;
----------

---------
[default:
        statement;]
}
```

OR

Ans. while loop is an entry controlled loop where the program control enters into the loop body only when the test expression is true. But in do while loop, the loop body statements will execute at least once irrespective of the test expression.

Example

```
int i=10;
while (i<5)
{
cout<<i;
i=i+1;
}
```

Will not give any output since the test expression evaluates false.

But,

```
int i=10;
do
{
cout<<i;
i=i+1;
}
while(i<5);
```

Will display 10 as output since the cout statement in loop body is executed once before checking the test expression.

30. do while loop is a ....controlled loop. **[March 2015, Score 1]**

Ans. Exit

31. Write a C++ program to check whether the given number is prime or not.

[March 2015, Score 5]

OR

Explain the various iteration statements in C++ with syntax and examples

Ans. int main()

```
{
 int n, i, flag = 0;
cout<<"Enter a number";
cin>>n;
for(i=2; i<=n/2; ++i)
 {
        if(n%i==0)
        {
        flag=1;
         break;
        }
}
```

```
    if (flag==0)
            cout<<n<<" is a prime number";
    else
            cout<<n<<" is not a prime number";
    return 0;
    }
```

OR

<u>while loop</u>

<u>Syntax :</u>

```
    initialisation;
    while(expression)
    {
    loop_body;
    update statement;
    }
```

<u>Example:</u>

```
    i=2;
    while(i<=50)
    {
            cout<<i;
            i=i+1;
    }
```

<u>do while loop</u>

<u>Syntax:</u>

```
    initialisation;
    do
    {
    loop_body;
    update statement;
    }
    while(expression);
```

<u>Example</u>

```
    i=1;
    do
```

```
{
cout<<i;
i=i+1;
}
while(i<=50);
```

for loop

Syntax:
```
for(initialisation; teste xpression; update statement)
{
loop body;
}
```

Example
```
for(i=1;i<=100;i++)
{
cout<<i;
}
```

****

Chapter – 8 Computer Networks

1. The protocol used for internet communication is ------------- **[March 2020, Score 1]**
   Ans. TCP/IP

2. What are the uses of repeaters? **[March 2020, Score 2]**

   Ans. Repeaters are used to receive the incoming signal, amplify it to their original strength and retransmit it.

3. Write the characteristics of Bluetooth transmission? **[March 2020, Score 2]**
   Ans. Characteristics of Bluetooth transmission :
   i). Not a line of sight communication
   ii). Can connect up to 8 devices

4 . Differentiate LAN and WAN **[March 2020, Score 3]**