

1. C++ REVISION TOUR

2012 Delhi:

1.a) Give the difference between the type casting and automatic type conversion. Also, give a suitable C++ code to illustrate both. 2

Ans. Automatic Type Conversion: It is an implicit process of conversion of a data from one data type to another. It is performed by the compiler. It is also called as type promotion.

For example:

```
int N = 65;
char C = N;    // Automatic type conversion
cout<<C;
```

Output:

A

Type Casting: It is an explicit process of conversion of a data from one type to another. (It is performed by the programmer.)

For example

```
int A=1, B=2;
float C = (float)A/B;    //Type Casting
cout<<C;
```

Output:

0.5

b) Which C++ header file(s) are essentially required to be included to run/execute the following C++ source code (Note: Do not include any header file, which is/are not required): 1

```
void main()
{ char TEXT[ ]="SomeThing";
  cout<<"Remaining SMS Chars:"<<
    160-strlen(TEXT)<<endl;
}
```

Ans: iostream.h (for cout)
string.h (for strlen ());

(f) Observe the following program and find out, which output(s) out of (i) to (iv) **will not** be expected from the program? What will be the minimum and the maximum value assigned to the variable Chance?

```
#include<iostream.h>
#include<stdlib.h>
void main()
{ randomize( );
  int Arr[ ]={9,6},N;
  int Chance=random(2)+10;
  for(int C=0;C<2;C++)
  { N=random(2);
    cout<<Arr[N]+Chance<<"#";
  }
}
```

- (i) 9#6#
- (ii) 19#17#
- (iii) 19#16#
- (iv) 20#16#

Ans: (i) 9#6#
Minimum Value: 10
Maximum Value: 11

2011 Delhi:

1. (a) What is the difference between Local Variable and Global Variable? Also, give a suitable C++ code to illustrate both. 2

Ans:

Local Variables: Local variables are those variables which are declared within a function or a compound statement and these variables can only be used within that function/scope.

Global Variables: Global variables are those variables which are not declared within any function or scope. So, these variables can be accessed by any function of the program.

Example:

```
#include<iostream.h>
#include<conio.h>
int G;    // Global variable declared
void Fun ( )
{
  int L=25;// Local variable of function Fun ( ) assigned value 25
  G=5;    // Global Variable is accessed and assigned value 5
  cout<<G<<endl; //Value of global variable is displayed as 5
  cout<<L<<endl; // Value of local variable is displayed as 25
}
void main ( )
{
  Fun ( ) ;    // Function call
  G = G + 5;    // Global variable is incremented by 5
  cout<<G<<endl; // Global variable is displayed as 10
}
```

(b) Write the names of the header files, which is/are essentially required to run/execute the following C++ code: 1

```
void main ( )
{
  char C, String [ ] = "Excellence Overload";
  for (int I=0; String [ I ] != '\0'; I ++ )
  if (String [I] == 'l')
    cout<<endl;
  else
  {
    C=toupper(String[I]);
    cout<<C ;
  }
}
```

Ans: iostream.h ctype.h

(c) Rewrite the following program after removing the syntactical errors (if any). Underline each correction. 2

```
#include[iostream.h]
typedef char Text(80) ;
void main ( )
{
Text T= "Indian";
int Count=strlen(T) ;
cout<<T<<'has'<<Count<<'characters'<<endl;
}
```

Ans:

```
#include<iostream.h>
#include<string.h>
typedef char Text [80];
void main ( )
{
Text T= "Indian";
int Count=strlen(T);
cout<<T<< "has" <<Count<< "characters"<<endl;
}
```

(d) Find the output of the following program: 3

```
#include<iostream.h>
void ChangeArray(int Number, int ARR[ ], int Size)
{
for (int L =0; L<Size; L++)
if (L<Number)
ARR [L] +=L;
else
ARR [L] *=L;
}
void Show (int ARR [ ], int Size)
{
for (int L=0; L<Size; L++)
(L%2!=0)?cout<<ARR[L]<<"#":
cout<<ARR[L]<<endl;
}
void main ( )
{
int Array [ ] = {30, 20, 40, 10, 60, 50};
ChangeArray (3, Array, 6) ;
Show (Array, 6) ;
}
```

Ans: 30
21#42
30#240
250#

(f) Go through the C++ code shown below, and find out the possible output or outputs from the suggested Output Options (i) to (iv). Also, write the least value and highest value, which can be assigned to the variable Guess. 2

```
#include <iostream.h>
#include <stdlib.h>
```

```
void main ( )
{
randomize ( ) ;
int Guess, High=4;
Guess=random {High)+ 50 ;
for {int C=Guess ; C<=55 ; C++}
cout<<C<<"#";
}
```

(i) 50 # 51 # 52 # 53 # 54 # 55 #

(ii) 52 # 53 # 54 # 55

(iii) 53 # 54 #

(iv) 51 # 52 # 53 # 54 # 55

Ans: (i) 50 # 51 # 52 # 53 # 54 # 55 #
Least value 50
Highest value 53

2011 Outside Delhi:

1. (a) What is the difference between Type Casting and Automatic Type conversion? Also, give a suitable C++ code to illustrate both.

Ans: Refer 2012 Delhi

(b) Write the names of the header files, which is/are essentially required to run/execute the following c++ code:

```
void main ( )
{ char CH,Text[ ]="+ve Attitude";
for (int I=0 ; Text[I] !='\0' ;I++)
if (Text[I]==' ')
cout<<endl;
else
{ CH=toupper (Text [I]) ;
cout<<CH;
}
}
```

Ans: iostream.h, ctype.h

(c) Rewrite the following program after removing the syntactical errors (if any). Underline each correction. 2

```
include<iostream.h>
typedef char [80] String;
void main ( )
{ String S= "Peace";
int L=strlen(S) ;
cout<<S<< 'has'<<L<< 'characters'<<endl;
}
```

Ans:

```
#include<string.h>
#include<iostream.h>
typedef char String [80];
void main ( )
{
String S = "Peace";
int L= strlen(S) ;
cout<<S<< "has" << L << "characters"<<endl;
}
```

(d) Find the output of the following program:3

```
#include<iostream.h>
void SwitchOver(int A [ ], int N, int Split)
{
for (int K=0 ; K<N; K++)
if (K<Split)
    A[K]+ =K;
else
    A [K]*=K;
}
void Display (int A [ ], int N)
{
for (int K=0 ; K<N ; K++)
    cout<<A[K]<<"%":cout<<A(K)<<endl;
}
void main ( )
{
int H[ ]= {30,40,50,20,10,5};
SwitchOver (H, 6, 3);
Display (H, 6);
}
```

Ans:

30%41
52%60
40%25

(f) Go through the C++ code shown below, and find out the possible output or outputs from the suggested Output Options (i) to (iv). Also, write the minimum and maximum values, which can be assigned to the variable MyNum. 2

```
#include<iostream.h>
#include <stdlib.h>
void main ( )
{
randomize ( ) ;
int MyNum, Max=5;
MyNum = 20 + random (Max) ;
for (int N=MyNum; N<=25;N++)
cout<<N<<"*";
}
```

(i) 20*21*22*23*24*25

(ii) 22*23*24*25*

(iii) 23*24*

(iv) 21*22*23*24*25

Ans (ii) 22*23*24*25*
Minimum value 20
Maximum value 24

2010 Delhi:

1. (a) What is the difference between automatic type conversion and type casting? Also, give a suitable C++ code to illustrate both. 2

Ans: Refer 2012 Outside Delhi

(b) Which C++ header file(s) will be essentially required to be included to run/ execute the following C++ code? 1

```
void main()
{
int Eno=123, char Ename[ ]="Rehan Swamp";
cout<<setw(5)<<Eno<<setw(25)<<EName<<endl;
}
```

Ans. (i) iostream.h (ii) iomanip.h

(d) Find the output of the following program : 3

```
#include <iostream.h>
struct POINT
{ int X, Y, Z;
};
void StepIn(POINT & P, int Step=1)
{ P.X+=Step;
P.Y-=Step;
P.Z+=Step;
}
void StepOut(POINT & P, int Step=1)
{ P.X-=Step;
P.Y+=Step;
P.Z-=Step;
}
void main ( )
{ POINT P1={15, 25, 5}, P2={10, 30, 20};
StepIn(P1);
StepOut(P2,4);
cout<<P1.X<<"<<P1.Y<<"<<P1.Z<<endl
;
cout<<P2.X<<"<<P2.Y<<"<<P2.Z<<endl
;
StepIn(P2,12);
cout<<P2.X<<"<<P2.Y<<"<<P2.Z<<endl
;
}
```

Ans.

16, 24, 6
6, 34, 16
18, 22, 28

(e) Find the output of the following program : 2

```
#include <iostream.h>
#include <ctype.h>

void ChangeIt(char Text[ ], char C)
{ for (int K=0;Text[K]!='\0';K++)
{ if (Text[K]>='F' && Text[K]<='L')
Text[K]=tolower (Text[K]);
else
if (Text[K]=='E' || Text[K]=='e')
Text[K]=C;
else
if (K%2==0)
Text[K]=toupper(Text[K]);
else
Text[K]=Text[K-1];
}
```

```

    }
}

void main ()
{
    char OldText[ ]="pOwERALone";
    ChangeIt(OldText,'%');
    cout<<"New
TEXT:"<<OldText<<endl;
}

```

Ans.

New TEXT : PPW % RRIIN%

(f) The following code is from a game, which generates a set of 4 random numbers. Yallav is playing this game, help him to identify the correct option(s) out of the four choices given below as the possible set of such numbers generated from the program code so that he wins the game. Justify your answer. 2

```

#include <iostream.h>
#include <stdlib.h>
const int LOW=15;
void main ()
{
    randomize( ) ;
    int POINT=5, Number;
    for (int i=1;i<=4;i++)
    {
        Number=LOW+random(POINT) ;
        cout<<Number<<" ";
        POINT--;
    }
}

```

(i) 19:16:15:18:

(ii) 14:18:15:16:

(iii) 19:16:14:18

(iv) 19:16:15:16:

Ans.

(iv) 19:16:15:16:

Justification is as follows:

I	POINT	random (POINT)	Minimum Number	Maximum Number
1	5	0 to 4	15	19
2	4	0 to 3	15	18
3	3	0 to 2	15	17
4	2	0 to 1	15	16

The only option that satisfies these values is option (iv).

2010 Outside Delhi:

1. (a) What is the difference between call by value and call by reference? Also, give a suitable C++ code to illustrate both. 2

Ans.

Call by value: The formal parameter makes a copy of actual parameter. It does not make the changes In actual parameter If the changes are done In formal parameters.

Call by reference: The formal parameter Is an alias of actual parameter. The changes made In the formal parameter are reflected In actual parameter. It is preceded by &.

```
void Calculator(int A,int & B )
```

```

{
    A++;
    a+=A;
}

```

Here A is called by value and B is called by reference.

(b) Which C++ header file(s) will be essentially required to be included to run/execute the following C++ code: 1

```

void main()
{
    int Rno=24; char Name [] =" Amen Singhanian";
    cout<<setw(10)<<Rno<<setw(20)<<Name<<endl;
}

```

Ans.

iostream.h, iomanip.h

(d) Find the output of the following program: 3

```

#include <iostream.h>
struct THREE_D
{
    int X,Y,Z;
};
void MoveIn(THREE_D &T, int Step=l)
{
    T.X+=Step;
    T.Y-=Step;
    T.Z+=Step;
}
void MoveOut(THREE_D &T, int Step=l)
{
    T.X-=Step;
    T.Y+=Step;
    T.Z-=Step;
}
void main ()
{
    THREE_D T1={10,20,5},T2={30,10,40};
    MoveIn(T1);
    MoveOut(T2,5) ;
    cout<<T1.X<<" "<<T1.Y<<" "<<T1.Z<<endl;
    cout<<T2.X<<" "<<T2.Y<<" "<<T2.Z<<endl;
}
MoveIn(T2,10);
cout<<T2.X<<" "<<T2.y<<" "<<T2.Z<<endl;
;
}

```

Ans.

11, 19, 6

25, 15, 35

35, 5, 45

(e) Find. the output of the following program: 2

```

#include <iostream.h>
#include <ctype.h>
void MyCode (char Msg [], char CH)
{
    for (int (Cnt=0;Msg[Cnt]!='\0';Cnt++)

```

```

{ if (Msg[Cnt]>='B' && Msg[Cnt]<='G')
    Msg[Cnt]=tolower(Msg[Cnt]);
else
if (Msg[Cnt]=='A' || Msg[Cnt]=='a')
    Msg[Cnt]=CH;
else
if (Cnt%2==0)
    Msg[Cnt]=toupper(Msg[Cnt]);
else
    Msg[Cnt]=Msg[Cnt-1];
}
}
void main ()
{ char MyText [] =" ApEACeDriVE";
  MyCode(MyText,'@');
  cout<<"NEW TEXT:"<<MyText<<endl;
}

```

Ans.

NEW TEXT :@@e@ccddHh

(f) The following code is from a game, which generates a set of 4 random numbers. Praful is playing this game, help him to identify the correct option(s) out of the four choices given below as the possible set of such numbers generated from the program code so that he wins the game. Justify your answer. 2

```

#include <iostream.h>
#include <stdlib.h>
const int LOW=25;
void main ()
{
    randomize() ;
    int POINT=5,Number;
    for (int I=1;I<=4;I++)
    {
        Number=LOW+random(POINT);
        cout<<Number<<" ";
        POINT--;
    }
}

```

- (i) 29:26:25:28:
(ii) 24:28:25:26:
(iii) 29:26:24:28:
(iv) 29:26:25:26:

Ans.

(iv) 29:26:25:26:

Justification is as follows:

I	POINT	Number	
		Minimum	Maximum
1	5	25	29
2	4	25	28
3	3	25	27
4	2	25	26

The only option that satisfies these values is option (iv).

2009 Delhi:

1. (a) What is the difference between call by value and call by reference? Give an example in C++ to illustrate both. 2

Ans:

Call by value is used to create a temporary copy of the data coming from the actual parameter into the formal parameter. The changes done in the function in formal parameter are not reflected back in the calling environment. It does not use '&' sign.

Call by reference is used to share the same memory location for actual and formal parameters and so changes done in the function are reflected back in the calling environment. It uses '&' sign.

```

void Compute(int A, int &B)
{ A++;
  B++;
  cout<<"In the function"<<endl;
  cout<<"A="<<A<<"&"<<"B="<<B<<endl;
}
void main ()
{ int I=50,J=25;
  cout<<"Before function call "<<endl;
  cout<<"I="<<I<<"&"<<"J="<<J <<endl;
  Compute (I,J) ;
  cout<<"After function call "<<endl;
  cout<<I<<"&"<<"J="<<J <<endl;
}

```

OUTPUT

Before function call

I=50&J=25

In the function

A=51&B=26

After function call

I=50&J=26

1(b) Write the names of the header files to which the following belong: 1

(i) puts () (ii) sin ()

Ans (i) stdio.h (ii) math. h

1.(e) Find the output of the following program:2

```

#include <iostream.h>
#include <ctype.h>
void Encode (char Info [ ], int N) ;
void main ( )
{ char Memo [ ] = "Justnow" ;
  Encode (Memo, 2) ;
  cout<<Memo<<endl ;
}
void Encode (char Info [ ], int N)
{ for (int I = 0 ; Info[I] !='\0' ; I++)
  if (I%2== 0)
      Info[I] = Info[I] -N ;
  else if (islower(Info[I]))
      Info[I] = toupper(Info[I]) ;
}

```

```

else
    Info[I] = Info[I] +N ;
}

```

Ans

HuqTIOu

(f) Study the following program and select the possible output from it : 2

```

#include <iostream.h>
#include <stdlib.h>
const int LIMIT = 4 ;
void main ( )
{
    randomize( ) ;
    int Points;
    Points = 100 + random(LIMIT) ;
    for (int P=Points ; P>=100 ; P-- )
        cout<<P<<"# " ;
    cout<<endl;
}

```

- (i) 103#102#101#100#
- (ii) 100#101#102#103#
- (iii) 100#101#102#103#104#
- (iv) 104#103#102#101#100#

Ans

(i) 103#102#101#100#

2009 Outside Delhi:

1. (a) What is the difference between Actual Parameter and Formal Parameter? Give an example in C++ to illustrate both types of parameters. 2

Ans A parameter used in the function call is known as Actual Parameter. It is used to send the data to function. A parameter used in the function definition is known as Formal Parameter, It is used to accept the data from actual parameter.

```

void Seventimes(int A)    //A is formal parameter
{
    cout<<7*A;
}
void main ( )
{
    int P=6;
    Seventimes(P);    //p is actual parameter
}

```

Other answer for the same question:

Ans)The parameters in the function call statement (or calling function) are called as Actual Parameters.

The parameters in the function definition (or called function) are called as Formal Parameters.

Eg:

```

void manip(int x, int y)
{
    ---
    ---
}
void main( )
{
    int a,b;

```

```

----
manip(a,b);
}
Here a,b are Actual Parameters and
x,y are Formal Parameters.

```

1.(b) Write the names of the header files to which the following belong: 1

(i) **setw()** (ii) **sqrt()**

Ans

(i) **iomani.h** (ii) **math.h**

1.(e) Find the output of the following program:2

```

#include <iostream.h>
#include <ctype.h>
void Secret (char Mig[ ], int N);
void main ( )
{
    char SMS[ ] = "rEPorTmE" ;
    Secret{SMS,2);
    cout<<SMS<<endl;
}
void Secret(char Msg[ ], int N)
{
    for (int C=0; Msg[C] !=' \0' ;C++)
        if (C%2==0)
            Msg[C] = Msg[C]+N;
        else if (isupper(Msg[C]))
            Msg[C] = tolower(Msg[C]);
        else
            Msg[C] = Msg[C]-N;
}

```

Ans

teRmttoe

(f) Study the following program and select the possible output from it : 2

```

#include <iostream.h>
#include <stdlib.h>
const int MAX=3 ;
void main ( )
{
    randomize( ) ;
    int Number ;
    Number = 50 + random{MAX) ;
    for (int P=Number; P>=50; P-- )
        cout<<p<<" # " ;
    cout<<endl;
}

```

- (i) 53#52#51#50#
- (ii) 50#51#52#
- (iii) 50#51#
- (iv) 51#50#

Ans

(iv) 51#50#

(Solution: MAX value is 3. That's why random(MAX) can produce 0 or 1 or 2. (random(N) will produce no. between 1 to n-1). The Number value may be 50 or 51 or 52. The P value starts from Number, upto 50, each time decreases by 1.

So Possible outputs are as follows:

52#51#50#

51#50#
50#.

As the output 51#50# is available in given answers, so 51#50# is the answer.)

2008 Delhi:

1.b) Name the header files that shall be needed for the following code: 1

```
void main( )
{ char String[ ] = "Peace";
  cout << setw(2)<<String;
}
```

Ans) iomanip.h, iostream.h

1. c) Rewrite the following program after removing the syntactical error(s) if any. Underline each correction. 2

```
#include<iostream.h>
void main( )
{ First = 10, Second = 20;
  Jumpto(First;Second);
  Jumpto(Second);
}
void Jumpto(int N1, int N2 = 20)
{ N1=N1+N2;
  count<<N1>>N2;
}
```

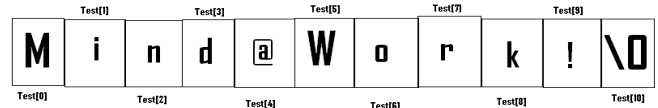
Ans)

```
#include<iostream.h>
void Jumpto(int N1,int N2=20); //Prototype missing
void main( )
{ int First = 10, Second = 20; //Data type missing
  Jumpto(First,Second); //Comma to come instead of ;
  Jumpto(Second);
}
void Jumpto(int N1, int N2)
{ N1=N1+N2;
  cout<<N1<<N2; //Output operator << required
}
```

d) Find the output of the following program;3

```
#include<iostream.h>
#include<ctype.h>
void main( )
{ char Text[ ] = "Mind@work!";
  for(int I=0; Text[I]!='\0';I++)
  { if(!isalpha(Text[I]))
    Text[I]='*';
    else if(isupper(Text[I]))
      Text[I]=Text[I]+1;
    else
      Text[I] = Text[I+1];
  }
  cout<<Text;
}
```

Ans: Text[] =



When I=0

Since Text[0] is 'M', Upper Case Letter, (isupper(Text[I]) will becomes true.

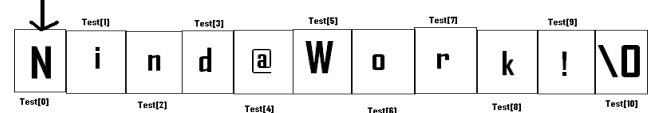
So Text[I] =Text[I]+1

So Text[0]=Text[0]+1

Text[0] =77(ASCII Value of M) + 1 = 78

=N(78 is ASCII Value of N)

Now the String Text[] =



When I=1

Since Text[1] is 'i', Which is a character, but which is not Upper case, else part will be executed.

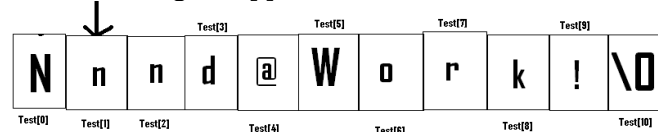
Ie Text[I]=Text[I+1]

Here Text[1]=Text[1+1]

=Text[2]

Ie 'n' will be stored in place of 'i'

Now the String Text[] =



When I=2

Since Text[2] is 'n', Which is a character, but which is not Upper case, else part will be executed.

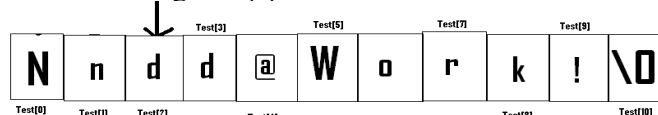
Ie Text[I]=Text[I+1]

Here Text[2]=Text[2+1]

=Text[3]

Ie 'd' will be stored in place of 'n'

Now the String Text[] =



When I=3

Since Text[3] is 'd', Which is a character, but which is not Upper case, else part will be executed.

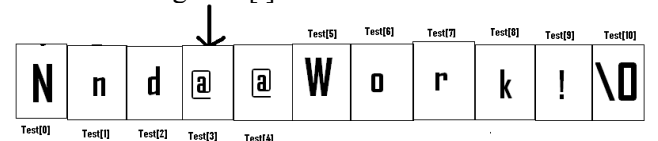
Ie Text[I]=Text[I+1]

Here Text[3]=Text[3+1]

=Text[4]

Ie '@' will be stored in place of 'd'

Now the String Text[] =



When I=4

Since Text[4] is '@', Since which is not an alphabet, (!isalpha(Text[I])) will becomes true.

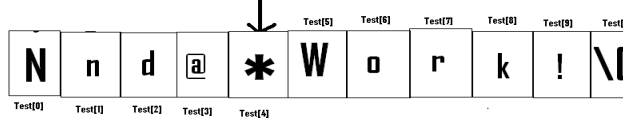
Ie if(!isalpha(Text[I]))

Text[I]='*';

Ie Text[4]='*'

Ie '*' will be stored in place of '@'

Now the String Text[] =



When I=5

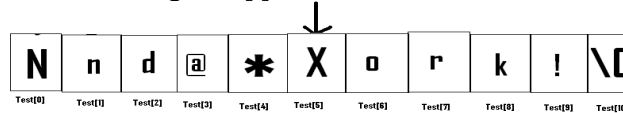
Since Text[5] is 'W', Upper Case Letter, (isupper(Text[I]) will becomes true.

So Text[I] =Text[I]+1

So Text[5]=Text[5]+1

Text[5] =87(ASCII Value of W) + 1 = 88 =X(88 is ASCII Value of X)

Now the String Text[] =



When I=6

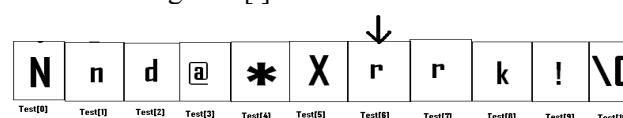
Since Text[6] is 'o', Which is a character, but which is not Upper case, else part will be executed.

Ie Text[I]=Text[I+1]

Here Text[6]=Text[6+1] =Text[7]

Ie 'r' will be stored in place of 'o'

Now the String Text[] =



When I=7

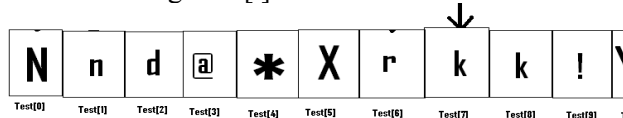
Since Text[7] is 'r', Which is a character, but which is not Upper case, else part will be executed.

Ie Text[I]=Text[I+1]

Here Text[7]=Text[7+1]=Text[8]

Ie 'k' will be stored in place of 'r'

Now the String Text[] =



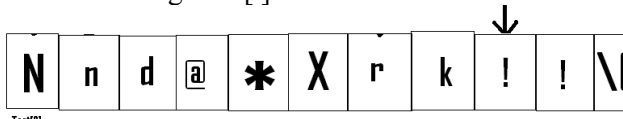
When I=8

Since Text[8] is 'k', Which is a character, but which is not Upper case, else part will be executed. Ie Text[I]=Text[I+1]

Here Text[8]=Text[8+1] =Text[9]

Ie '!' will be stored in place of 'k'

Now the String Text[] =



When I=9

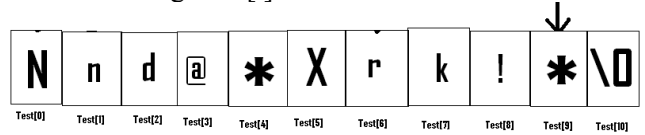
Since Text[9] is '!', Since which is not an alphabet, (!isalpha(Text[I])) will becomes true.

Ie if(!isalpha(Text[I])) Text[I]='*';

Ie Text[9]='*'

Ie '*' will be stored in place of '!'.

Now the String Text[] =



Output: **Nnd@*Xrk!***

e) Find the output of the following program:

```

2
#include<iostream.h>
void main( )
{ int U=10,V=20;
  for(int I=1;I<=2;I++)
  { cout<<"[1]"<<U++<<"&"<<V - 5 <<endl;
    cout<<"[2]"<<++V<<"&"<<U + 2 <<endl;
  }
}

```

Ans: Output:

```

[1]10&15
[2]21&13
[1]11&16
[2]22&14

```

f) In the following program, find the correct possible output(s) from the options:

```

2
#include<stdlib.h>
#include<iostream.h>
void main( )
{ randomize( );
  char City[][10]=
  {"DEL","CHN","KOL","BOM","BNG"};
  int Fly;
  for(int I=0; I<3;I++)
  { Fly=random(2) + 1;
    cout<<City[Fly]<<" ";
  }
}

```

Outputs:

- (i) DEL : CHN : KOL:
- (i) CHN: KOL : CHN:
- (ii) KOL : BOM : BNG:
- (iii) KOL : CHN : KOL:

Ans) Since random(2) gives either 0 or 1, Fly value will be either 1 or 2. (random(n) gives you any number between 0 to n-1)

City[1] is "CHN". City[2] is "KOL". Since I value from 0 to 2 (ie<3), 3 iterations will takes place. So the possible output consists 3 strings separated by :, each of them may be either "CHN" or "KOL".

So the possible output will be

- (ii) CHN : KOL : CHN:
- (iv) KOL :CHN : KOL:

1.a) What is the difference between #define and const? Explain with suitable example. 2

Ans: While they both serve a similar purpose, #define and const act differently. When using #define the identifier gets replaced by the specified value by the compiler, before the code is turned into binary. This means that the compiler makes the substitution when you compile the application.

Eg: #define number 100

In this case every instance of “number” will be replaced by the actual number 100 in your code, and this means the final compiled program will have the number 100 (in binary).

#define with different types of data:

*The #define preprocessor allows us to define symbolic names and constants.

Eg: #define PI 3.14159

*The #define allows you to make text substitutions before compiling the program.

Eg: #define MAX 70

* Before compilation, if the C++ preprocessor finds MAX as one word, in the source code, it replaces it with the number 70.

* The #define preprocessor can be used in the creation of macros (code substitution).

Eg: #define SQUARE(x) x*x

Before compilation, if the C++ preprocessor finds SQUARE(x), where x is any value in the source code, it replaces it with its square (ie x*x). Here a macro substitutes text only; It does not check for data types.

On the other hand, when we use **const** and the application runs, memory is allocated for the constant and the value gets replaced when the application is run.

Syntax: const type variable_name=value;

Eg: const int a=10;

The value of a constant is fixed and in the above example, the value for a in entire program is 10 only. You cannot change the value of a, since it is declared as constant.

Difference between #define and const in declaration:

1.#define: #define symbolic_constant value.

Eg: #define number 100 //No semicolon, no equal to symbol.

2.const: const type variable_name=value;

Eg: const number=100; //Semicolon, equal to symbol.

2008 Outside Delhi:

1.b) Name the header files that shall be needed for the following code:

```
1
void main( )
{ char word[]="Exam";
  cout<<setw(20)<<word;
```

```
}
Ans: iostream.h, iomanip.h
```

1.c) Rewrite the following program after removing the syntax error(s) if any. Underline each correction. 2

```
#include<iostream.h>
void main()
{ One=10,Two=20;
  Callme(One;Two);
  Callme(Two);
}
void Callme(int Arg1,int Arg2)
{ Arg1=Arg1+Arg2;
  Count<<Arg1>>Arg2;
}
```

Ans:

```
void Callme(int Arg1,int Arg2=20);
#include<iostream.h>
void main()
{ int One=10,Two=20;
  Callme(One,Two); //Given ; instead of ,
  Callme(Two);
}
void Callme(int Arg1,int Arg2)
{
  Arg1=Arg1+Arg2;
  cout<<Arg1<<Arg2;
}
```

1.d) Find the output of the following program:3

```
#include<iostream.h>
#include<ctype.h>
void main()
{ char Mystring[ ] = "what@OUTPUT!";
  for(int I=0; Mystring[I]!='\0';I++)
  { if(!isalpha(Mystring[I]))
    Mystring[I]='*';
    else if(isupper(Mystring[I]))
    Mystring[I]=Mystring[I]+1;
    else
    Mystring[I]=Mystring[I]+1;
  }
  cout<<Mystring;}
```

Ans:
Output: **hat@*PVUQVU***

e) Find the output of the following program: 2

```
#include<iostream.h>
void main()
{ int A=5,B=10;
  for(int I=1;I<=2;I++)
  { cout<<"Line1"<<A++<<"&"<<B-2 <<endl;
    cout<<"Line2"<<++B<<"&"<<A +3 <<endl;
  }
}
```

Ans: Output:

Line15&8
Line211&9
Line16&9
Line212&10

f) In the following program, find the correct possible output(s) from the options: 2

```
#include<stdlib.h>
#include<iostream.h>
void main()
{
    randomize();
    char Area[ ][10]={"NORTH","SOUTH","EAST","WEST"};
    int ToGo;
    for(int I=0; I<3;I++)
    {
        ToGo=random(2) + 1;
        cout<<Area[ToGo]<<" ";
    }
}
```

Ans: **Outputs:**

- (i) SOUTH : EAST : SOUTH :
- (ii) NORTH : SOUTH : EAST :
- (iii) SOUTH : EAST : WEST :
- (iv) SOUTH : EAST : EAST :

Ans)Since random(2) gives either 0 or 1, ToGo value will be either 1 or 2. (random(n) gives you any number between 0 to n-1)Area[1] is "SOUTH".Area[2] is "EAST". Since I value from 0 to 2 (ie<3), 3 iterations will takes place. So the possible output consists 3 strings separated by :, each of them may be either "SOUTH" or "EAST".

So the possible output will be

- (i) SOUTH : EAST : SOUTH :
- (iv) SOUTH : EAST : EAST :

1.a) What is the purpose of using a typedef command in C++? Explain with suitable example 2

Ans: C++ allows you to define explicitly new data type names by using the keyword typedef. Using typedef does not actually create a new data class, rather it defines a new name for an existing type. This can increase the portability of a program as only the typedef statements would have to be changed. Typedef makes your code easier to read and understand. Using typedef can also aid in self documenting your code by allowing descriptive names for the standard data types.

The syntax of the typedef statement is
 typedef type name;

Where type is any C++ data type and name is the new name for this type. This defines another name for the standard type of C++. For example, you could create a new name for float values by using the following statement:

typedef float amount;

This statement tells the compiler to recognize amount as an alternative name for float. Now you could create float variables using amount.

amount loan, saving, installment;

Using typedef does not replace the standard C++ data type name with the new name, rather the new name is in addition to the existing name. You still can create float variables using float. Once a new name has been defined by typedef, it can be used as a type for another typedef also. Eg: typedef amount money;

Now, this statement tells the compiler to recognize money as another name for amount, which itself is another name for float. Typedef does not create any new data types rather provides an alternative name for standard types. Reference provides an alias name for a variable and typedef provides an alias name for a data type.

2007 Delhi :

1.a) Differentiate between a Run Time Error and Syntax Error. Also give suitable examples of each in c++. 2

Ans: Run Time Errors: Errors that occur during the execution of a program are called as run time errors. It is caused of some illegal operation taking place or inavailability of desired or required conditions for the execution of the program. For instance, if a program is trying to open a file which does not exist or it could not be opened, it results into an execution error. Similarly, if enough memory is not available or an expression is trying to divide a number by zero are run-time errors.

Eg: Division by zero. c=a/b ;

User will give the values of a and b at the time of program execution. If he give the value of b as '0', then division by zero, ie a run time error occurs.

Syntax Errors:Syntax errors occur when rules of a programming languages (syntax) is misused. Ie when a grammatical rule of C++ is violated.

Eg (i) c=a+b In this statement, since there is no semicolon at the end of the statement, there will occurs a syntax error.

(ii) cin<<a; In this statement, since stream insertion operator (<<) has given instead of stream extraction operation(>>), there will occurs a syntax error.

1.b) Name the header file(s) that shall be needed for successful compilation of the following C++ code. 1

```
void main()
{
    char String[20];
    gets(String);
    strcat(String,"CBSE");
    puts(String);
}
```

Ans) stdio.h string.h

1. c) Rewrite the following program after removing the syntactical error(s) if any. Underline each correction. 2

```
#include<iostream.h>
const int Max 10;

void main()
{ int Numbers[Max];
  Numbers = {20,50,10,30,40};
  for(Loc=Max-1;Loc>=10;Loc--)
    cout<<Numbers[Loc];
}
```

Ans)

```
#include<iostream.h>
const int Max=10;//Constant Variable 'Max' must be
// initialized.Declaration Syntax Error

void main()
{ int Numbers[Max]={20,50,10,30,40};
  for(Loc=Max-1;Loc>=0;Loc--)
    cout<<Numbers[Loc];
}
```

e) Find the output of the following program. 3

```
#include<iostream.h>
void Withdef(int HisNum=30)
{ for(int I=20;I<=HisNum;I+=5)
  cout<<I<<" ";
  cout<<endl;
}
void Control(int &MyNum)
{ MyNum+=10;
  Withdef(MyNum);
}
void main()
{ int YourNum=20;
  Control(YourNum);
  Withdef();
  cout<<"Number="<<YourNum<<endl;
}
```

Ans:

Output:
20,25,30,
20,25,30,
Number=30

f) In the following C++ program what is the expected value of MyMarks from options (i) to (iv) given below. Justify answer.

```
#include<stdlib.h>
#include<iostream.h>
void main()
{ randomize( );
  int Marks[]={99,92,94,96,93,95},MyMarks;
  MyMarks = Marks [1+random(2)];
  cout<<MyMarks<<endl;
} (i)99 (ii)94 (iii)96 (iv) None of the above.
```

Ans: Output:

(ii) 94

2007 Outside Delhi:

1.a) Differentiate between a Logical Error and Syntax Error. Also give suitable examples of each in C++. 2

Ans: Logical Error: A logical error is that error which causes a program to produce incorrect or undesired output.

An incorrectly implemented algorithm or use of a variable before its initialization, or unmarked end for a loop, or wrong parameters passed are causes logical errors. These must be handled carefully.

For instance, if we are trying to print the table of a number 5 and if we say

```
counter=1;
while(counter>8)
{ cout<<n*counter;
  counter=counter+1;
}
```

Here the loop would not be executed even once as the condition (counter>8) is not fulfilled at all. Therefore, no output will be produced. Such an error is logical error.

Syntax Error: Syntax errors occur when rules of a programming languages (syntax) is misused. It when a grammatical rule of C++ is violated.

Eg (i) c=a+b

In this statement, since there is no semicolon at the end of the statement, there will occur a syntax error.

(ii) cin<<a; In this statement, since stream insertion operator (<<) has given instead of stream extraction operation (>>), there will occur a syntax error.

1.b) Name the header file(s) that shall be needed for successful compilation of the following C++ code. 1

```
void main()
{ char Text[40];
  strcpy(Text,"AISSCE");
  puts(Text);
}
```

Ans:

string.h, stdio.h

1.c) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. 2

```
#include<iostream.h>
const int Size 5;
void main()
{ int Array[Size];
  Array={50,40,30,20,10};
  for(Ctr=0;Ctr<Size;Ctr++)
    cout<>Array[Ctr];
}
```

```

}
Ans)
#include<iostream.h>
const int Size=5;

```

```

void main()
{ int Array[Size];
  Array={50,40,30,20,10};
  for(Ctr=0;Ctr<Size;Ctr++)
    cout<<Array[Ctr];
}

```

1.e) Find the output of the following program 3

```

#include<iostream.h>
void Indirect(int Temp=20)
{ for(int I=10;I<=Temp;I+=5)
  cout<<I<<" ";
  cout<<endl;
}
void Direct(int &Num)
{ Num+=10;
  Indirect(Num);
}
void main()
{ int Number=20;
  Direct(Number);
  Indirect( );
  cout<<"Number ="<<Number<<endl;
}

```

Ans: Output:

**10,15,20,25,30,
10,15,20,
Number =30**

f) In the following C++ program what is the expected value of Mysore from options (i) to (iv) given below. Justify your answer. 2

```

#include<stdlib.h>
#include<iostream.h>
void main()
{ randomize();
  int Score[ ] = {25,20,34,56,72,63}, Myscore;
  cout<<Myscore<<endl;
}

```

(i) 25 (ii) 34 (iii) 20 (iv) None of the above.

Ans: Expected Output:

(i) **None of the above.**

2006 Delhi:

1.a) Name the header file to which the following belong: (i) abs() (ii) isupper() 1

Ans) (i) abs() - math.h, stdlib.h, complex.h
(ii) isupper() - ctype.h

1.e) Find the output of the following program 2

```

#include<iostream.h>
void main()
{ long NUM=1234543;
  int F=0,S=0;
  do
  { int R=NUM % 10;
    if (R %2 != 0)
      F += R;
    else
      S += R;
    NUM /= 10;
  } while (NUM>0);
  cout<<F-S;
} Ans: Output: 2

```

1.b) Illustrate the use of #define in C++ to define a macro. 2

Ans: The #define preprocessor can be used in the creation of macros (code substitution).

Eg: #define SQUARE(x) x*x

Before compilation, if the C++ preprocessor finds SQUARE(x), where x is any value in the source code, it replaces it with its square (ie x*x). Here a macro substitutes text only; It does not check for data types.

1.C) Rewrite the following program after removing the syntactical error(s), if any.

Underline each correction. 2

```

#include<iostream.h>
void main()
{ struct STUDENT
  {
    char stu_name[20];
    char stu_sex;
    int stu_age=17;
  } student;
  gets(stu_name);
  gets(stu_sex);
}

```

Ans:

```

#include<iostream.h>
#include<stdio.h>
void main()
{ struct STUDENT
  { char stu_name[20];
    char stu_sex;
    int stu_age;
  } student;
  //Initialization of variables inside a structure is not allowed.
  gets(student.stu_name);
  cin>>student.stu_sex;
  //A single character cannot be read using gets
}

```

1.f) What are Nested Structures? Give an example. 2

Ans: Nested structures are structures as member of another structure. For example, the date of birth is a structure within the structure of a student as shown below. These types of structures are known as nested structures.

Name	Roll	DOB			Marks
		DD	MM	YY	

Eg1:

```
struct date
{ int dd;
  int mm;
  int yy;
};
struct student
{ char name[20];
  int roll;
  date dob;
  int marks;
};
```

The member of a nested structure is referenced from the outermost to innermost with the help of dot operators.

student stud;

Then the members of the nested structure can be accessed as **stud.dob.mm=10;**

Eg2:

```
struct addr
{ int houseno;
  char area[26];
  char city[26];
  char state[26];
};
struct emp
{ int empno;
  char name[26];
  char design[16];
  addr address;
  float basic;
}worker;
```

2006 Outside Delhi:

1.a) Name the header file to which the following belong:

- (i) pow () (ii) random () 1

Ans:

- (i) abs () - math.h, stdlib.h, complex.h
(ii) random () - stdlib.h

1.e) Find the output of the following program 2

```
#include<iostream.h>
void main()
{ long Number=7583241;
  int First = 0, Second = 0;
  do
  { int R=Number%10;
    if(R%2 ==0)
      First += R;
    else
      Second += R;
```

```
Number /= 10;
  } while (Number > 0);
  cout<<First<<Second;
}
```

Ans: Output -2

1.C) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. 2

```
#include<iostream.h>
void main()
{ struct movie
  { char movie_name[20];
    char movie_type;
    int ticket_cost=100;
  }MOVIE;
  gets(movie_name);
  gets(movie_type);
}
```

Ans:

```
#include<iostream.h>
#include<stdio.h>
void main()
{ struct movie
  { char movie_name[20];
    char movie_type;
    int ticket_cost;
    //Initialization of variables inside a structure is not allowed.
  }MOVIE;
  gets(MOVIE.movie_name);
  cin>>MOVIE.movie_type;
  //A single character cannot be read using gets
}
```

2005 Delhi:

1.a) Differentiate between a Call by Value and Call by Reference, giving suitable examples of each. 2

Ans: Call by value: In call by value method, the called function creates a new set of variables and copies the values of arguments into them. The function does not have access to the original variables (actual parameters) and can only work on the copies of values it created. Passing arguments by value is useful when the original values are not to be modified.

In call by reference method, a reference to the actual argument (original variable) is passed to the called function. (Reference is an alias for a predefined variable. Ie the same variable value can be accessed by any of the two names: the original variable's name and the reference name.) Thus, in call by reference method, the changes are reflected back to the original values. The call by reference method is useful in situations where the values of the original variables are to be changed using a function.

Example:

```
void Calculator(int A,int & B )
{
A++;
a+=A;
}
```

Here A is called by value and B is called by reference.

1. b) Name the header files to which the following belong: (i) abs() (ii) strcmp() 1

Ans) (i) abs() - stdlib.h, math.h, complex.h
(ii) strcmp() - string.h

1. c) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. 2

```
#include<iostream.h>
const int Multiple 3;
void main()
{ value = 15;
for(int Counter = 1;Counter <=5;Counter ++, Value -= 2)
if(Value%Multiple == 0)
cout<<Value * Multiple;
cout<<endl;
else
cout<<Value + Multiple <<endl;
}
```

Answer:

```
#include<iostream.h>
const int Multiple=3;
void main()
{ int Value = 15;
for(int Counter = 1;Counter <=5;Counter ++, Value -=
2)
if(Value%Multiple == 0)
{ cout<<Value * Multiple;
cout<<endl;
}
else
cout<<Value + Multiple <<endl;
}
```

1.e) Find the output of the following program 2

```
#include<iostream.h>
#include<string.h>
#include<ctype.h>

void Convert(char Str[ ],int Len)
{ for(int Count=0;Count<Len;Count++)
{ if(isupper(Str[Count]))
Str[Count]=tolower(Str[Count]);
else if (islower(Str[Count]))
Str[Count]=toupper(Str[Count]);
else if(isdigit(Str[Count]))
Str[Count]=Str[Count]+1;
else Str[Count]='*';
}
}
```

```
void main()
{
char Text[ ]="CBSE Exam 2005";
int Size = strlen(Text);
Convert(Text,Size);
cout<<Text<<endl;
for(int C=0,R=Size - 1;C<=Size/2;C++,R--)
{
char Temp=Text[C];
Text[C]=Text[R];
Text[R]=Temp;
}
cout<<Text<<endl;
}
```

Ans:

Output:

**cbse*eXAM*3116
6113*MXAe*esbc**

1. f) Observe the following program SCORE.CPP carefully, if the value of Num entered by the user is 5, choose the correct possible output(s) from the options from (i) to (iv), and justify your option. 2

```
//Program: SCORE.CPP
#include<stdlib.h>
#include<iostream.h>
void main()
{ randomize( );
int Num,Rndnum;
cin>>Num;
Rndnum = random(Num) + 5;
for(int N = 1;N<=Rndnum;N++)
cout<<N<<" ";
}
```

Output Options:

(i) 1 2 3 4 (ii) 1 2
(iii) 1 2 3 4 5 6 7 8 9
(iv) 1 2 3

Ans: Expected Output:

(iii) 1 2 3 4 5 6 7 8 9

1.d) Find the output of the following program:

```
#include<iostream.h>
struct MyBox
{ int Length,Breadth,Height;
};
void Dimension(MyBox M)
{ cout<<M.Length<<"x"<<M.Breadth<<"x";
cout<<M.Height<<endl;
}
void main()
{ MyBox B1={10,15,5},B2,B3;
++B1.Height;
Dimension(B1);
B3=B1;
++B3.Length;
B3.Breadth++;
```

Output:

**10x15x6
11x16x6
10x16x11**

```

Dimension(B3);
B2=B3;
B2.Height+=5;
B2.Length--;
Dimension(B2);
}

```

2005 Outside Delhi :

1.b) Name the header files to which the following belong: (i) puts()

(ii) isalnum() 1

Ans)(i) puts() - stdio.h
(isalnum() - ctype.h

1.c) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. 2

```

#include<iostream.h>
const int divisor 5;
void main( )
{ Number = 15;
for(int Count=1;Count<=5;Count++,Number -= 3)
    if(Number % divisor == 0)
        cout<<Number / Divisor;
        cout<<endl;
    else
        cout<<Number + Divisor <<endl;
}

```

Ans:

```

#include<iostream.h>
const int divisor= 5;
void main( )
{ int Number = 15;
for(int Count=1;Count<=5;Count++,Number -= 3)
    if(Number % divisor == 0)
    { cout<<Number / Divisor;
      cout<<endl;
    }
    else
        cout<<Number + Divisor <<endl;
}

```

1.e) Find the output of the following program 2

```

#include<iostream.h>
#include<string.h>
#include<ctype.h>
void Change(char Msg[],int Len)
{
for(int Count=0;Count<Len;Count++)
{ if(islower(Msg[Count]))
    Msg[Count] = toupper(Msg[Count]);
  else if(isupper(Msg[Count]))
    Msg[Count] = tolower(Msg[Count]);
  else if (isdigit(Msg[Count]))
    Msg[Count]=Msg[Count]+1;
  else Msg[Count] = '*';
}
}

```

```

void main( )
{
char Message[ ]="2005 Tests ahead";
int Size=strlen(Message);
Change(Message,Size);
cout<<Message<<endl;
for(int C=0,R=Size - 1; C<=Size/2;C++,R--)
{ char Temp=Message[C];
  Message[C]=Message[R];
  Message[R]=Temp;
}
cout<<Message<<endl;
}

```

Ans: Output:

**3116*tESTS*AHEAD
DAEHA*SSTet*6113**

1.f) Observe the following program GAME.CPP carefully, if the value of Num entered by the user is 14, choose the correct possible output(s) from the options from (i) to (iv), and justify your option. 2

```

//Program:GAME.CPP
#include<stdlib.h>
#include<iostream.h>
void main( )
{ randomize( );
  int Num,Rndnum;
  cin>>Num;
  Rndnum=random(Num)+7;
  for(int N=1;N<=Rndnum;N++)
    cout<<N<<" ";
}

```

Output Options:

(i) 1 2 3 (ii) 1 2 3 4 5 6 7 8 9 10 11
(iii) 1 2 3 4 5 (iv) 1 2 3 4

Ans: Expected Output

(ii) 1 2 3 4 5 6 7 8 9 10 11

1.d) Find the output of the following program:

```

#include<iostream.h>
struct Package
{ int Length,Breadth,Height;
};
void Occupies(Package M)
{ cout<<M.Length<<"x"<<M.Breadth<<"x";
  cout<<M.Height<<endl;
}
void main( )
{ Package P1={100,150,50},P2,P3;
  ++P1.Height;
  Occupies(P1);
  P3=P1;
  ++P3.Length;
  P3.Breadth++;
  Occupies(P3);
  P2=P3;
}

```

Output:

**100x150x51
101x151x51
100x151x101**

```

P2.Height+=50;
P2.Length--;
Occupies(P2);
}

```

2004:

1.b) Write the names of the header files to which the following belong:

(i) gets() (ii) strcmp() (iii)abs() (iv)isalnum()

Ans: (i)gets() - stdio.h
(ii)strcmp() - string.h
(iii)abs() - math.h,
stdlib.h,complex.h
(iv)isalnum() - ctype.h

1.e) What will be the output of the following program

```

#include<iostream.h>
void main( )
{ int var1=5,var2=10;
  for(int i=1,i<=2;i++)
  { cout<<var1++<<"\t"<< - - var2<<endl;
    cout<<var2- -<<"\t"<<+ + var1<<endl;
  }
}

```

Ans: Output:

5	9
9	7
7	7
7	9

f)Write definition for a function SumSequence() in C++ with two arguments/parameters – double X and int n. The function should return a value of type double and it should perform sum of the following series.

$1/x - 3!/x^2 + 5!/x^3 - 7!/x^4 + 9!/x^5 - \dots$ upto n terms.

Note: The symbol ! represents Factorial of a number ie $5! = 1 \times 2 \times 3 \times 4 \times 5$.

```

#include<iostream.h>
#include<math.h>
#include<conio.h>
double SumSequence(int x1,int n1);
void main()
{ int x;
  int n;
  clrscr();
  cout<<"Enter the vaue of X and N";
  cin>>x>>n;
  cout<<"\nThe sum of the series =
    "<<SumSequence(x,n);
  getch();
}
double SumSequence(int x1,int n1)
{
  double sum=0;

```

```

int c=0;
for(int i=1;i<=(2*n1);i=i+2)
{ int f=1;
  for(int j=1;j<=i;j++)
  { f=f*j;
  }
  c=c+1;
  if(c%2==1)
  { sum=sum+f/(pow(x1,c));
  }
  else
  { sum=sum-f/(pow(x1,c));
  }
}
return sum;
}

```

1.c) Rewrite the corrected code for the following program. Underline each correction if any.

```

#include<iostream.h>
structure Supergym
{ int member number;
  char membername[20];
  char membertype[]="HIG";
};
void main( )
{ Supergym person1,person2;
  cin>>"Member Number: ";
  cin>>person1.membhernumber;
  cout<<"Member Name: ";
  cin>>person1.membername;
  person1.member type = "MIG";
  person2=person1;
  cin>>"Member Number: "
    <<person2.membernumber;
  cin<<"Member Name"
    <<person2.membername;
  cin<<"Member Number:"
    <<person2.membertype;
}

```

Ans:

```

#include<iostream.h>
#include<string.h>
struct Supergym
{ int membernumber;
  char membername[20];
  char membertype[4];
};
void main( )
{ Supergym person1,person2;
  cin>>"Member Number: ";
  cin>>person1.membernumber;
  cout<<"Member Name: ";
  cin>>person1.membername;
  strcpy(person1.membertype,"MIG");
  person2=person1;
  cin>>"Member Number:"

```



```

    >>person2.membernumber;
cin>>"Member Name"
    >>person2.membername;
cin>>"Member Number:"
    >>person2.membertype;
}

```

2003:

1.a) What is the difference between global variables and local variables? Give an example to illustrate the same .2

Ans: The local variables are the variables defined within any function (or block) and are hence accessible only within the block in which they are declared. In contrast to local variables, variables declared outside of all the functions in a program are called global variables. These variables are defined outside of any function, so they are accessible to all functions. These functions perform various operations on the data. They are also known as External Variables.

Eg: #include<iostream.h>
int a,b;
void main()
{ float f;
 ---;
 ---;
}

In the above program segment, a and b are global variables, we can access a and b from any function. f is local variable to function main(), we can access f from main() only.

1.b) Name the header file, to which the following built-in function belongs:

- (i) strcmp() (ii) getc() 1
- Ans:** (i) strcmp() - string.h
(ii) getc() - stdio.h

1.c) Rewrite the following program after removing all the syntax error(s) if any.2

```

#include<iostream.h>
void main()
{ int P[ ]={90,10,24,15};Q,Number=4;
  Q=9;
  for[int I=Number-1;I>=0,I--]
  switch(I)
  { case 0;
    case 3:cout>>P[I]*Q<<endl;break;
    case 1:
    case 2: cout<<P[I]+Q;
  }
}

```

Ans:
#include<iostream.h>
void main()
{ int P[]={90,10,24,15};Q,Number=4;
 Q=9;
 for(int I=Number-1;I>=0;I--)

```

switch(I)
{ case 0:
  case 3:cout<<P[I]*Q<<endl; break;
  case 1:
  case 2: cout<<P[I]+Q;
}
}

```

1.e) Write the output of the following program:

```

#include<iostream.h>
int Execute(int M)
{ if(M%3==0)
  return M*3;
  else
  return M+10;
}
void Output(int B=2)
{ for(int T=0;T<B;T++)
  cout<<Execute(T)<<"*";
  cout<<endl;
}
void main()
{ Output(4);
  Output( );
  Output(3);
}

```

Output:

0*11*12*9*
0*11*
0*11*12*

f) Write a C++ function SUMFUN() having two parameters Y(of type double) and m(of type integer) with a result type as double to find the sum of the series given below:

$$Y + Y^3 / 2! + Y^5 / 3! + \dots + Y^{2m-1} / m!$$

```

#include<iostream.h>
#include<math.h>
#include<conio.h>
double SUMFUN(int y1,int m1);
void main()
{ int y;
  int m;
  clrscr();
  cout<<"Enter the vaue of Y and M";
  cin>>y>>m;
  cout<<"\n\nThe sum of the series =
  "<<SUMFUN(y,m);
  getch();
}
double SUMFUN(int y1,int m1)
{ double sum=0;
  double upper;
  for(int i=1;i<=m1;i++)
  { int f=1;
    for(int j=1;j<=i;j++)
    { f=f*j;
    }
    upper=pow(y1,(i*2-1));
    sum=sum+upper/f;
  }
  return sum;
}

```

1.d) Give the output of the following program:

```
#include<iostream.h>
struct Pixel
{
    int C,R;
};

void Display(Pixel P)
{
    cout<<"col"<<P.C<<"Row"<<P.R<<endl;
}

void main( )
{
    Pixel X={40,50}, Y,Z;
    Z=X;
    X.C+=10;
    Y=X;
    Y.R+=20;
    Z.C-=15;
    Display(X);
    Display(Y);
    Display(Z);
}
```

Output:
col50Row50
col50Row70
col25Row50

2002:

1.b) Name the header files of C++ to which the following functions belong: 2

(i) get() (ii) open()
(iii) abs() (iv) strcat()

Ans: (i) get() - iostream.h
(ii) open() - fstream.h
(iii) abs() - math.h, stdlib.h
(iv) strcat() - string.h

1.c) Find the syntax error(s), if any, in the following program. 2

```
#include<iostream.h>
void main( )
{
    int x;
    cin>>x;
    for( int y=0,y<10,y++)
        cout<<x+y;
}
```

Ans:

```
#include<iostream.h>
void main( )
{
    int x;
    cin>>x;
    for( int y=0;y<10;y++)
        cout<<x+y;
}
```

1.d) Write the output of the following program 2

```
void main( )
{
    int x=5,y=5;
    cout<<x- -;
    cout<<" ";
    cout<<- - x;
    cout<<" ";
}
```

```
    cout<<y- -<<" "<<- -y;
}
```

Ans: Output:

5,3,4,4

1.e) Write the output of the following program 3

```
#include<iostream.h>
void X(int &A,int &B)
{
    A=A+B;
    B=A-B;
    A=A-B;
}

void main( )
{
    int a=4,b=18;
    X(a,b);
    cout<<a<<" "<<b;
}
```

Ans: Output:

18,4

f) Write a function called zero_Small() that has two integer arguments being passed by reference and sets the smaller of the two numbers to 0. Write the main program to access this function. 4

```
#include<iostream.h>
#include<conio.h>
void zero_Small(int &A,int &B)
{
    if(A<B)
        A=0;
    else
        B=0;
}

void main( )
{
    clrscr();
    int a,b;
    cout<<"Enter any two values...";
    cin>>a>>b;
    cout<<"Initial values of a and b are ";
    cout<<a<<" "<<b<<endl;
    zero_Small(a,b);
    cout<<endl<<"The final values of a and b are ";
    cout<<a<<" "<<b;
    cout<<endl;
    cout<<"\nPress any key to continue...";
    getch();
}
```

2001:

1.b) Name the header file to be included for the use of the following built in functions:

(i) getc() (ii) strcat() 1

Ans: (i) getc() - stdio.h
(ii) strcat() - string.h

1.e) Give the output of the following program:

```
#include<iostream.h>
```

```
#include<conio.h>
int g=20;
void func(int &x,int y)
{
    x=x-y;
    y=x*10;
    cout<<x<<','<<y<<'\n';
}
void main( )
{
    int g=7;
    func(g,::g);
    cout<<g<<','<<::g<<'\n';
    func(::g,g);
    cout<<g<<','<<::g<<'\n';
}

```

Ans: Output:

-13,-130
-13,20
33,330
-13,33

1.f) Write a function named SUMFIN(), with arguments x, N, which returns the sum of N terms of the following series: 4

$$x - x^3/3 + x^5/5 - x^7/7 + x^9/9$$

```
#include<iostream.h>
#include<math.h>
#include<conio.h>
double SUMFIN(int x1,int n1);
void main()
{
    int x;
    int n;
    clrscr();
    cout<<"Enter the vaue of X and N";
    cin>>x>>n;
    cout<<'\nThe sum of Series = "<<SUMFIN(x,n);
    getch();
}
double SUMFIN(int x1,int n1)
{
    double sum=0;
    int c=0;
    for(int i=1;i<=(2*n1);i=i+2)
    {
        c=c+1;
        if(c%2==1)
        {
            sum=sum+(pow(x1,i))/i;
        }
        else
        {
            sum=sum-(pow(x1,i))/i;
        }
    }
    return sum;
}

```

1.e) Give the output of the following program. 3

```
#include<iostream.h>
#include<conio.h>
int g=20;
void func(int &x,int y)
{
    x=x-y;
    y=x*10;
    cout<<x<<','<<y<<'\n';
}

```

Answer:

-13,-130
-13,20
33,330
-13,33

```
void main( )
{
    int g=7;
    func(g,::g);
    cout<<g<<','<<::g<<'\n';
    func(::g,g);
    cout<<g<<','<<::g<<'\n';
}

```

2000:

1.b) Name the header file, to which following built in function belong: 2

(i) isupper() (ii) setw()
(iii) exp() (iv) strcmp()

Ans) (i) isupper() - ctype.h
 (ii) setw() - iomanip.h
 (iii) exp() - math.h
 (iv) strcmp() - string.h

1.c) Will the following program execute successfully? If not, state the reason(s) 2

```
#include<stdio.h>
void main( )
{
    int s1,s2,num;
    s1=s2=0;
    for(x=0;x<11;x++)
    {
        cin<<num;
        if(num>0)s1+=num;else s2/=num;
    }
    cout<<s1<<s2;
}

```

Ans: The program will not execute successfully. Because some syntax errors are there in the program. They are

(i) cin and cout, stream objects used but iostream.h header file is not included in the program.
(ii) x is not declared, it should be declared as int.
(iii) With cin, we should use >> instead of <<.
(iv) The shorthand operator /=, is given wrongly as =/.

So the corrected program is as follows:

```
#include<iostream.h>
void main( )
{
    int s1,s2,num;
    s1=s2=0;
    for(int x=0;x<11;x++)
    {
        cin>>num;
        if(num>0)s1+=num;else s2/=num;
    }
    cout<<s1<<s2;
}

```

d) Give the output of the following program segment (Assuming all required header files are included in the program): 2

```
char *NAME="a ProFiLe";
for(int x=0;x<strlen(NAME);x++)
    if(islower(NAME[x]))
        NAME[x]=toupper(NAME[x]);

```

```

else if(isupper(NAME[x]))
    if(x%2!=0)
        NAME[x]=tolower(NAME[x-1]);
    else
        NAME[x]--;
cout<<NAME<<endl;

```

Ans: Output: **AOROOliE**

1.e) Write the output of the following program

```

#include<iostream.h>
int func(int &x,int y=10)
{ if(x%y==0) return ++x;else return y- -;
}
void main()
{ int p=20,q=23;
  q=func(p,q);
  cout<<p<<q<<endl;
  p=func(q);
  cout<<p<<q<<endl;
  q=func(p);
  cout<<p<<q<<endl;
}

```

Ans: Output: **2023**
1023
1111

f) Write a function seqsum() in C++ with two arguments, double x and int n. The function should return a value of type double and it should find the sum of the following series. **4**
 $1 + x/2! + x^2/4! + x^3/6! + x^4/8! + x^5/10! + \dots + x^n/(2n)!$

```

#include<iostream.h>
#include<math.h>
#include<conio.h>
double seqsum(int x1,int m1);
void main()
{ int x;
  int m;
  clrscr();
  cout<<"Enter the vaue of X and M";
  cin>>x>>m;
  cout<<"\nThe sum of the series =
    "<<seqsum(x,m);
  getch();
}
double seqsum(int x1,int m1)
{ double sum=1;
  for(int i=1;i<=m1;i++)
  { int f=1;
    for(int j=1;j<=2*i;j++)
    { f=f*j;
    }
    sum=sum+pow(x1,i)/f;
  }
  return sum;
}

```

1999:

1.a) Why main() function is so special. Give two reasons? **1**

Ans: Execution of the program starts and ends at main(). The main() is the driver function of the program. If it is not present in a program, no execution can take place.

1.b) Name the header file of C++ to which following functions belong. (i)strcat() (ii) scanf() (iii) getchar() (iv)clrscr()

Ans: (i)strcat() - string.h
(ii)scanf() - stdio.h
(iii)getchar() - stdio.h
(iv)clrscr() - conio.h

1.c) Find the syntax error(s), if any, in the following program:

```

#include<iostream.h>
main()
{ int x[5],*y,z[5];
  for(i=0;i<5;i++)
  { x[i]=i;
    z[i]=i+3;
    y=z;
    x=y;
  }
}

```

Ans (i) Line No 5: Undefined symbol 'i'. The variable 'i' is not declared in the program.
(ii)Line No 10:Assign the value of a pointer to an integer variable. Ie error in x=y.

1.e) Write the output of the following program.

```

#include<iostream.h>
static int i=100;
void abc( )
{ static int i=8;
  cout<<"first ="<<i;
}
main( )
{ static int i=2;
  abc( );
  cout<<"second ="<<i<<endl;
}

```

Ans: Output: **First =8second =2**

1.f) Write a C++ function that converts a 2-digit octal number into binary number and prints the binary equivalent.

```

#include<iostream.h>
#include<conio.h>
void binary(int a)
//member function for conversion
{ int i,b[5]; //integer array 6
  for(i=3;i>=1;i--)
  { b[i]=a%2;
    a=a/2;
  }
  for(i=1;i<=3;i++)

```

```

    cout<<b[i];
}
void main()
{ int n,x,y;
  clrscr( );
  cout<<"Enter a two digit octal number: ";
  cin>>n;
  x=n/10;
  y=n%10;
  binary(x);
  binary(y);
  getch( );
}

```

1998:

1.b) Name the header files, to which the following built in functions belongs to:

(i)cos() (ii)setw()
 (iii)toupper() (iv)strcpy()

Ans: (i) cos() - math.h
 (ii) setw() - iomanip.h
 (iii) toupper() - ctype.h
 (iv) strcpy() - string.h

1.c) Find the syntax error(s), if any, in the following program:

```

#include<iostream.h>
void main( )
{ int R; W=90;
  while W>60
  { R=W-50;
    switch(W)
    { 20:cout<<"Lower Range"<<endl;
      30:cout<<"Middle Range "<<endl;
      40:cout<<"Higher Range"<<endl;
    }
  }
}

```

Ans:

- (i) Line 1: It should be, #include<iostream.h>
- (ii) Line 4: Variables should be separated using commas. It should be int R,W=90;
- (iii) Line 5: Test expression should be in braces. It should be while (W>60)
- (iv) Line 10: It should be case 20;
- (v) Line 11: It should be case 30;
- (vi) Line 13: It should be case 40;

So the corrected version of the program is as follows:

```

#include<iostream.h>
void main( )
{ int R, W=90;
  while (W>60)
  {R=W-50;

```

```

switch(W)
{ case 20:cout<<"Lower Range"<<endl;
  case 30:cout<<"Middle Range "<<endl;
  case 40:cout<<"Higher Range"<<endl;
}
}
}

```

1.d) Give the **output** of the following program segment:

```

char *NAME="IntRAnE1";
for(int x=0;x<strlen(NAME); x++)
if(islower(NAME[x])
NAME[x]=toupper(NAME[x]));
else if(isupper(NAME[x]))
if(x%2==0)
NAME[x]=tolower(NAME[x]);
else
NAME[x]=NAME[x-1];
puts(NAME);

```

Ans: Output: **INTTaNEE**

1.f) Write the output of the following program:

```

#include<iostream.h>
void Execute(int &X,int Y=200)
{ int TEMP=X+Y;
  X+=TEMP;
  if(Y!=200)
  cout<<TEMP<<X<<Y<<endl;
}
void main( )
{ int A=50,B=20;
  Execute(B);
  cout<<A<<B<<endl;
  Execute(A,B);
  cout<<A<<B<<endl;
}

```

Output:

50240

290340240

340240

1.f) Write a C++ function having two value parameters X and N with result type float to find the sum of series given below:

$1 + x^1/2! + x^2/3! + x^3/4! + x^4/5! + \dots + x^n/(n+1)!$

```

#include<iostream.h>
#include<conio.h>
#include<math.h>
float sum_series(float X,int N) //function being declared
{ float sum=0,term;
  int fact,f;
  sum+=1;
  for(int i=1;i<=N;i++)
  { fact=1;
    for(f=1;f<=(i+1);f++)
    fact*=f;
    term=pow(X,i)/fact;
    sum+=term;
  }
  return(sum);
}
void main( )

```

```

{ clrscr();
float x1;
int n1;
cout<<"\nEnter the value of X and N";
cin>>x1>>n1;
cout<<"\nThe Sum of the Series
..."<<sum_series(x1,n1);
getch();
}

```

Model Paper 1 for 2008-09 Batch:

Q1.(a) What is the difference between Global Variable and Local Variable? 2

Answer:

Global Variable	Local Variable
<ul style="list-style-type: none"> It is a variable, which is declared outside all the functions It is accessible throughout the program 	<ul style="list-style-type: none"> It is a variable, which is declared with in a function or with in a compound statement It is accessible only within a function/compound statement in which it is declared
<pre> #include <iostream.h> float NUM=900; //NUM is a global variable void LOCAL(int T) { int Total=0; //Total is a local variable for (int I=0;I<T;I++) Total+=I; cout<<NUM+Total; } void main() { LOCAL(45); } </pre>	

1.b) Write the names of the header files to which the following belong: 1

(i) strcmp() (ii) fabs()

Answer: (i) string.h (ii) math.h

1(d) Find the output of the following program: 3

```

#include <iostream.h>
struct PLAY
{ int Score, Bonus;
};
void Calculate(PLAY &P, int N=10)
{ P.Score++;
P.Bonus+=N;
}
void main()
{ PLAY PL={10,15};
Calculate(PL,5);
cout<<PL.Score<<": "<<PL.Bonus<<endl;
Calculate(PL);
}

```

```

cout<<PL.Score<<": "<<PL.Bonus<<endl;
Calculate(PL,15);
cout<<PL.Score<<": "<<PL.Bonus<<endl;
}

```

Answer:

11:20

12:30

13:45

1.e) Find the output of the following program 2

```

#include <iostream.h>
#include <ctype.h>
void Encrypt(char T[])
{ for (int i=0;T[i]!='\0';i+=2)
if (T[i]=='A' || T[i]=='E')
T[i]='#';
else if (islower(T[i]))
T[i]=toupper(T[i]);
else
T[i]='@';
}
void main()
{ char Text[]="SaVE EArthH";
//The two words in the string Text are separated
by single space
Encrypt(Text);
cout<<Text<<endl;
}

```

Answer:

@a@E@E#rTH

1.f) In the following program, if the value of N given by the user is 15, what maximum and minimum values the program could possibly display? 2

```

#include <iostream.h>
#include <stdlib.h>
void main()
{ int N,Guessme;
randomize();
cin>>N;
Guessme=random(N)+10;
cout<<Guessme<<endl;
}

```

Answer:

Maximum Value:24 Minimum Value:10

Model Paper 2 for 2008-09 Batch:

1.b) Write the names of the header files to which the following belong: 1

(i) frexp() (ii) isalnum()

Answer:

(i) math.h (ii) ctype.h

1.d) Find the output of the following program 3

```

#include <iostream.h>

```

```

void Changethecontent(int Arr[], int Count)
{
    for (int C=1;C<Count;C++)
        Arr[C-1]+=Arr[C];
}
void main()
{
    int A[ ]={3,4,5},B[ ]={10,20,30,40},C[ ]={900,1200};
    Changethecontent(A,3);
    Changethecontent(B,4);
    Changethecontent(C,2);
    for (int L=0;L<3;L++)
        cout<<A[L]<<'#';
    cout<<endl;
    for (L=0;L<4;L++)
        cout<<B[L] <<'#';
    cout<<endl;
    for (L=0;L<2;L++)
        cout<<C[L] <<'#';
}

```

Answer:

```

7#9#5#
30#50#70#40#
2100#1200#

```

1.(e) Find the output of the following program:2

```

#include <iostream.h>
struct Game
{
    char Magic[20];int Score;
};
void main()
{
    Game M={"Tiger",500};
    char *Choice;
    Choice=M.Magic;
    Choice[4]='P';
    Choice[2]='L';
    M.Score+=50;
    cout<<M.Magic<<M.Score<<endl;
    Game N=M;
    N.Magic[0]='A';N.Magic[3]='J';
    N.Score-=120;
    cout<<N.Magic<<N.Score<<endl;
}

```

Answer:

```

TiLeP550
AiLJP430

```

1.f) In the following program, if the value of N given by the user is 20, what maximum and minimum values the program could possibly display? 2

```

#include <iostream.h>
#include <stdlib.h>
void main()
{
    int N,Guessnum;
    randomize();
    cin>>N;
    Guessnum=random(N-10)+10;
    cout<<Guessnum<<endl;
}

```

```

}

```

Answer:

```

Maximum Value:19 Minimum
Value:10

```

Sample Paper 1 for 2009-10:

1.a) What is the difference between Global Variable and Local Variable? Also, give a suitable C++ code to illustrate both. 2

Ans) Global Variable:

- * It is a variable which is declared outside all the functions
- * It is accessible throughout the program

Local Variable:

- * It is a variable which is declared with in a function or with in a compound statement
- * It is accessible only within a function/ compound statement in which it is declared

```

#include <iostream.h>
float NUM=900; //NUM is a global variable
void LOCAL(int T)
{
    int Total=0; //Total is a local variable
    for (int I=0;I<T;I++)
        Total+=I;
    cout<<NUM+Total;
}
void main()
{
    LOCAL(45);
}

```

1.b) Which C++ header file(s) will be essentially required to be included to run /execute the following C++ code: 1

```

void main()
{
    char Msg[ ]="Sunset Gardens";
    for (int I=5;I<strlen(Msg);I++)
        puts(Msg);
}

```

A) (i) string.h (ii) stdio.h

1. d) Find the output of the following program:3

```

#include <iostream.h>
struct GAME
{
    int Score, Bonus;
};
void Play(GAME &g, int N=10)
{
    g.Score++;
    g.Bonus+=N;
}
void main()
{
}

```

```

GAME G={110,50};
Play(G,10);
cout<<G.Score<<". "<<G.Bonus<<endl;
Play(G);
cout<<G.Score<<". "<<G.Bonus<<endl;
Play(G,15);
cout<<G.Score<<". "<<G.Bonus<<endl;
}

```

- A) **111:60 3**
112:70
113:85

e) Find the output of the following program: 2

```

#include <iostream.h>
void Secret(char Str[ ])
{
    for (int L=0;Str[L]!='\0';L++);
    for (int C=0;C<L/2;C++)
    if (Str[C]=='A' || Str[C]=='E')
        Str[C]='#';
    else
    {
        char Temp=Str[C];
        Str[C]=Str[L-C-1];
        Str[L-C-1]=Temp;
    }
}
void main()
{
    char Message[ ]="ArabSagar";
    Secret(Message);
    cout<<Message<<endl;
}

```

A) #agaSbarr

f) In the following program, if the value of Guess entered by the user is 65, what will be the expected output(s) from the following options (i), (ii), (iii) and (iv)? 2

```

#include <iostream.h>
#include <stdlib.h>
void main()
{
    int Guess;
    randomize();
    cin>>Guess;
    for (int I=1;I<=4;I++)
    {
        New=Guess+random(I);
        cout<<(char)New;
    }
}

```

- (i) ABBC
(ii) ACBA
(iii) BCDA
(iv) CABD

A)

(i) ABBC

Sample Paper 2 for 2009-10 Batch:

1.(a) What is the difference between Actual Parameter and Formal Parameters? Also, give a suitable C++ code to illustrate both. 2

A) Actual Parameter Formal Parameter 2

* It is a parameter, which is used in function call to send the value from calling environment

* It is a parameter, which is used in function header, to receive the value from actual parameter

```

#include <iostream.h>
void Calc(int T) //T is formal parameter
{
    cout<<5*T;
}
void main()
{
    int A=45;
    Calc(A); //A is actual parameter
}

```

(b) Write the names of the header files to which the following belong: 1

(i) frexp() (ii) isalnum()

A) (i) math.h (ii) ctype.h

(c) Rewrite the following program after removing the syntactical errors (if any). Underline each correction. 2

```

#include <iostream.h>
struct Pixels
{
    int Color,Style;}
void ShowPoint(Pixels P)
{ cout<<P.Color,P.Style<<endl;}
void main()
{
    Pixels Point1=(5,3);
    ShowPoint(Point1);
    Pixels Point2=Point1;
    Color.Point1+=2;
    ShowPoint(Point2);
}

```

Ans:

```

#include <iostream.h> 2
struct Pixels
{
    int Color,Style;
};
void ShowPoint(Pixels P)
{
    cout<<P.Color<<P.Style<<endl;
}
void main()
{

```

```

    Pixels Point1={5,3};
    ShowPoint(Point1);
    Pixels Point2=Point1;

```



```

    Point1.Color+=2;
    ShowPoint(Point2);
}

```

(d) Find the output of the following program: 3

```

#include <iostream.h>
void Changethecontent(int Arr[ ], int Count)
{
    for (int C=1;C<Count;C++)
        Arr[C-1]+=Arr[C];
}
void main()
{
    int A[]={3,4,5},B[]={10,20,30,40},C[]={900,1200};
    Changethecontent(A,3);
    Changethecontent(B,4);
    Changethecontent(C,2);
    for (int L=0;L<3;L++) cout<<A[L]<<'#';
        cout<<endl;
    for (L=0;L<4;L++) cout<<B[L] <<'#';
        cout<<endl;
    for (L=0;L<2;L++) cout<<C[L] <<'#';
}

```

Ans:

```

7#9#5#
30#50#70#40#
2100#1200#

```

(e) Find the output of the following program: 2

```

#include <iostream.h>
struct Game
{
    char Magic[20];int Score;
};
void main()
{
    Game M={"Tiger",500};
    char *Choice;
    Choice=M.Magic;
    Choice[4]='P';
    Choice[2]='L';
    M.Score+=50;
    cout<<M.Magic<<M.Score<<endl;
    Game N=M;
    N.Magic[0]='A';N.Magic[3]='J';
    N.Score-=120;
    cout<<N.Magic<<N.Score<<endl;
}

```

A)

```

TiLeP550
AiLJP430

```

(f) In the following program, if the value of N given by the user is 20, what maximum and minimum values the program could possibly display? 2

```

#include <iostream.h>
#include <stdlib.h>

```

```

void main()
{
    int N,Guessnum;
    randomize();
    cin>>N;
    Guessnum=random(N-10)+10;
    cout<<Guessnum<<endl;
}

```

A)

Maximum Value: 19 Minimum Value: 10

Sample Paper 1 for 2011-12:

1. a) Differentiate between the post increment and pre increment operators. Also, give a suitable C++ code to illustrate both. 2

Post Increment: ++ is an increment operator to increment the value of a variable by one. When used after the operand it is known as post increment operator.

Pre Increment: When ++ is used before an operand to increment its value by one, it is called a pre-increment operator.

Example:

```

#include<iostream.h>
void main( )
{
    int NUM=9;
    cout<<++NUM; //10 will be displayed
    cout<<NUM++; //10 will be displayed
    cout<<NUM; //11 will be displayed
}

```

b) Which C++ header file(s) will be essentially required to be included to run/execute the following C++ code: 1

```

void main( )
{
    int Last=25;
    for(int C=9;C<=Last;C++)
        cout<<C<<" "<<sqrt(C)<<endl;
}

```

Ans:

(i) iostream.h (for cout)
(ii) math.h (for sqrt())

c) Find the output of the following program:

```

#include<iostream.h>
struct STOCK
{
    Int Ino,Qty;
};
void Buy(STOCK &I,int TQ=2)
{
    I.Qty+=TQ;
}
void main( )
{
    STOCK i[2]

```

Header files – Important Functions.

From Old Papers

Name the header files that shall be needed for the following

2009 Outside Delhi:

- (i) **setw()** – iomanip.h
- (ii) **sqrt()** – math.h

2008 Delhi & OD:

Due to cout, include **iostream.h**

Due to setw(), include **iomanip.h**

2007 Delhi & OD:

Due to strcat(), include **string.h**

Due to gets(), include **stdio.h**

2006 Delhi:

- (i) **abs()** - math.h, stdlib.h
- (ii) **isupper()** – ctype.h

2006 Outside Delhi

- (i) **abs()** - math.h, stdlib.h
- (ii) **random()** - stdlib.h

2005 Delhi:

- (i) **abs()** - stdlib.h, math.h
- (ii) **strcmp()** - string.h

2005 OD:

- (i) **puts()** - stdio.h
- (ii) **isalnum()** - ctype.h

2004 :

- (i) **gets()** - stdio.h
- (ii) **strcmp()** - string.h
- (iii) **abs()** - math.h, stdlib.h
- (iv) **isalnum()** - ctype.h

2003:

- (i) **strcmp()** - string.h
- (ii) **getc()** - stdio.h

2002:

- (i) **get()** - iostream.h
- (ii) **open()** - fstream.h
- (iii) **abs()** - math.h, stdlib.h
- (iv) **strcat()** - string.h

2001:

- (i) **getc()** - stdio.h
- (ii) **strcat()** - string.h

2000:

- (i) **isupper()** - ctype.h
- (ii) **setw()** - iomanip.h
- (iii) **exp()** - math.h
- (iv) **strcmp()** - string.h

1999:

- (i) **strcat()** - string.h
- (ii) **scanf()** - stdio.h
- (iii) **getchar()** - stdio.h
- (iv) **clrscr()** - conio.h

1998:

- (i) **cos()** - math.h
- (ii) **setw()** - iomanip.h
- (iii) **toupper()** - ctype.h
- (iv) **strcpy()** - string.h

Model Paper 1:

- (i) **strcmp()** – string.h
- (ii) **fabs()** – math.h

Model Paper 2:

- (i) **frexp()** – math.h
- (ii) **isalnum()** – ctype.h

ctype.h (Character functions)

isalnum(), isalpha(), isdigit(), islower(), isupper(), tolower(), toupper()

string.h (Generally starts with str)

strcat(), strcmp(), strcpy(), strlen(), strchr(), strcmp(), strlwr(), strew(),strupr()

iomanip.h

setw(), setprecision(), endl, flush().

stdlib.h

abs(), labs(), free(), random(), atof(), atoi(), atol(), strtol(), strtod(), calloc(), malloc(), realloc()

iostream.h

(cout, cin – these are streams available in iostream.h)

get() getline() read() write() put()
open() close() flush()
seekg() seekp() tellg() tellp()
bad() eof() fail() good()
clear()

stdio.h (Many of the functions starting with f)

printf() scanf()
fflush() fgetc() fgetchar() fgets() fopen()
fprintf() fputc() fputchar()
fputs() fread() freopen() fscanf() fseek()
fsetpos() fwrite() ftell()
fwrite() getc() getchar() gets() getw()
putc() putchar() puts() putw()
remove() rename()

conio.h

clrscr() getch() gotoxy() cprintf()

dos.h

sound() nosound() delay()

process.h

exit(0)

math.h

acos() acosl(), etc, etc div() exp() ceil()
ceil() fabs() floor() fmod() log()
pow() modf() poly() sqrt()

***” If WEALTH is lost, nothing is lost.
If HEALTH is lost, something is lost.
If CHARACTER is lost, everything is lost.”***

**XII Computer Science
Chapter: C++ Revision Tour
Important Models**

1.a) Name the header file to which the following belong: (i) abs() (ii) isupper() 1

Ans) (i) abs() - math.h, stdlib.h, complex.h
(ii) isupper() - ctype.h

2) Name the header file(s) that shall be needed for successful compilation of the following C++ code. 1

```
void main()
{ char String[20];
  gets(String);
  strcat(String,"CBSE");
  puts(String);
}
```

Ans) stdio.h string.h

3) In the following program, find the correct possible output(s) from the options: 2

```
#include<stdlib.h>
#include<iostream.h>
void main()
{ randomize();
  char Area[ ][10]
    ={"NORTH","SOUTH","EAST","WEST"};
  int ToGo;
  for(int I=0; I<3;I++)
  {
    ToGo=random(2) + 1;
    cout<<Area[ToGo]<<" ";
  }
}
```

Ans: Outputs:

- (i) SOUTH : EAST : SOUTH :
- (ii) NORTH : SOUTH : EAST :
- (iii) SOUTH : EAST : WEST :
- (iv) SOUTH : EAST : EAST :

4) Find the output of the following program. 2

```
#include<iostream.h>
#include<string.h>
#include<ctype.h>
void Change(char Msg[],int Len)
{ for(int Count=0;Count<Len;Count++)
```

```
{ if(islower(Msg[Count]))
  Msg[Count] = toupper(Msg[Count]);
  else if(isupper(Msg[Count]))
  Msg[Count] = tolower(Msg[Count]);
  else if (isdigit(Msg[Count]))
  Msg[Count]=Msg[Count]+1;
  else Msg[Count] = '*';
}
}
void main()
{ char Message[ ]="2005 Tests ahead";
  int Size=strlen(Message);
  Change(Message,Size);
  cout<<Message<<endl;
  for(int C=0,R=Size - 1; C<=Size/2;C++,R--)
  { char Temp=Message[C];
    Message[C]=Message[R];
    Message[R]=Temp; }
  cout<<Message<<endl;
}
```

Ans: Output:

**3116*tESTS*AHEAD
DAEHA*SSTE*6113**

5) Find the output of the following program 2

```
#include<iostream.h>
void main()
{ long NUM=1234543;
  int F=0,S=0;
  do
  { int R=NUM % 10;
    if (R %2 != 0)
      F += R;
    else
      S += R;
    NUM /= 10;
  } while (NUM>0);
  cout<<F-S;
}
```

Ans: Output: 2

6) Write the output of the following program 3

```
#include<iostream.h>
void X(int &A,int &B)
{ A=A+B;
  B=A-B;
  A=A-B;
}
void main()
{ int a=4,b=18;
  X(a,b);
  cout<<a<<" "<<b;
```

Ans: Output:

18,4

7) Give the output of the following program:

```
#include<iostream.h>
struct Pixel
{ int C,R;
```

```

};
void Display(Pixel P)
{
    cout<<"col"<<P.C<<"Row"<<P.R<<en
};
}
void main()
{
    Pixel X={40,50},Y,Z;
    Z=X;
    X.C+=10;
    Y=X;
    Y.R+=20;
    Z.C-=15;
    Display(X);
    Display(Y);
    Display(Z);
}

```

Output:

```

col50Row50
col50Row70
col25Row50

```

8) Find the output of the following program: 2

```

#include<iostream.h>
void main()
{ int U=10,V=20;
  for(int I=1;I<=2;I++)
  { cout<<"[1]"<<U++<<"&"<<V - 5 <<endl;
    cout<<"[2]"<<++V<<"&"<<U + 2 <<endl;
  }
}

```

Ans: Output:

```

[1]10&15
[2]21&13
[1]11&16
[2]22&14

```

9) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. 2

```

#include<iostream.h>
const int divisor 5;
void main()
{ Number = 15;
  for(int Count=1;Count<=5;Count++,Number -= 3)
  if(Number % divisor == 0)
    cout<<Number / Dividor;
    cout<<endl;
  else
    cout<<Number + Dividor <<endl;
}

```

Ans:

```

#include<iostream.h>
const int divisor= 5;
void main()
{ int Number = 15;
  for(int Count=1;Count<=5;Count++,Number -= 3)
  if(Number % divisor == 0)
  { cout<<Number / Dividor;
    cout<<endl;
  }
  else
    cout<<Number + Dividor <<endl;
}

```

10) Find the syntax error(s), if any, in the following program:

```

#include<iostream.h>
main()
{ int x[5],*y,z[5];
  for(i=0;i<5;i++)
  { x[i]=i;
    z[i]=i+3;
    y=z;
    x=y;
  }
}

```

Ans (i) Line No 5: Undefined symbol 'i'.
The variable 'i' is not declared in the program.
(ii)Line No 10:Assign the value of a pointer to an integer variable. Ie error in x=y.

11)Rewrite the following program after removing the syntactical error(s)if any. Underline each correction. 2

```

#include<iostream.h>
void main()
{ First = 10, Second = 20;
  Jumpto(First;Second);
  Jumpto(Second);
}
void Jumpto(int N1, int N2 = 20)
{ N1=N1+N2;
  count<<N1>>N2;
}

```

Ans)#include<iostream.h>
void Jumpto(int N1,int N2=20);
//Prototype missing
void main()
{ int First = 10, Second = 20;
//Data type missing
Jumpto(First,Second);
//Comma to come instead of ;
Jumpto(Second);
}
void Jumpto(int N1, int N2)
{ N1=N1+N2;
 cout<<N1<<N2;
 //Output operator << required
}

12) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. 2

```

#include<iostream.h>
void main()
{ struct movie
  { char movie_name[20];
    char movie_type;
    int ticket_cost=100;
  }MOVIE;
  gets(movie_name);
  gets(movie_type);
}

```

```

Ans: #include<iostream.h>
#include<stdio.h>
void main( )
{ struct movie
  { char movie_name[20];
    char movie_type;
    int ticket_cost;
//Initialization of variables inside a structure is not allowed.
  }MOVIE;
  gets(MOVIE.movie_name);
  cin>>MOVIE.movie_type;
//A single character cannot be read using gets
}

```

13) Write definition for a function SumSequence() in C++ with two arguments/parameters – double X and int n. The function should return a value of type double and it should perform sum of the following series.

$1/x - 3!/x^2 + 5!/x^3 - 7!/x^4 + 9!/x^5 - \dots$ upto n terms.

Note: The symbol ! represents Factorial of a number

ie $5! = 1 \times 2 \times 3 \times 4 \times 5$.

```

#include<iostream.h>
#include<math.h>
#include<conio.h>
double SumSequence(int x1,int n1);
void main()
{ int x;
  int n;
  clrscr();
  cout<<"Enter the vaue of X and N";
  cin>>x>>n;
  cout<<"\nThe sum of the series =
  "<<SumSequence(x,n);
  getch();
}
double SumSequence(int x1,int n1)
{ double sum=0;
  int c=0;
  for(int i=1;i<=(2*n1);i=i+2)
  { int f=1;
    for(int j=1;j<=i;j++)
    { f=f*j;
    }
    c=c+1;
    if(c%2==1)
    { sum=sum+f/(pow(x1,c));
    }
    else
    { sum=sum-f/(pow(x1,c));
    }
  }
  return sum;
}

```

Some Important Theorey Questions:

1. Differentiate between call by value and call by reference with example. (whole concept is imp)

2. Type Conversion.
3. Diff between various types of errors.
4. Diff between #define and const
5. Typedef keyword
6. Nested Structures.
7. Global variables and local variables.
8. Importance of main().

(Theory question we cannot guess. It can be on any of the topic covered in XI C++ Revision Tour)

XII Computer Science TEST - C++ Revision Tour

1. Name the header file to which the following belong: (i) isupper() (ii) setw()
- 2) Name the header file(s) that shall be needed for successful compilation of the following C++ code.

```

void main( )
{ char<< word[ ]="Exam";
  cout<<setw(20)<<word;
}

```

- 3) In the following program, find the correct possible output(s) from the options:

```

#include<iostream.h>
#include<stdlib.h>
const int MAX=20;
void main( )
{ randomize( );
  int SCORE=8,Num;
  for(int i=2;i<=5;i++)
  { Num=MAX+random(SCORE);
    cout<<Num<<" ";
    SCORE--;
  }
}

```

- (i) 24:24:25:25:
- (ii) 24:24:25:24:
- (iii) 26:25:24:23:
- (iv) 24:24:25:24:23

- 4) Find the output of the following program

```

#include<iostream.h>
#include<ctype.h>
#include<conio.h>
void MyCode(char Msg[],char CH)
{ for (int Cnt=0;Msg[Cnt]!='\0';Cnt++)
  {
    if (Msg[Cnt]>='B'&&Msg[Cnt]<='G')
      Msg[Cnt]=tolower(Msg[Cnt]);
    else
    if (Msg[Cnt]=='A' || Msg[Cnt]=='a')
      Msg[Cnt]=CH;
    else
    if (Cnt%2==0)
      Msg[Cnt]=toupper(Msg[Cnt]);
    else
      Msg[Cnt]=Msg[Cnt+2];
  }
}

```

```

}
void main ()
{ clrscr();
  cout<<endl<<endl;
  char MyText[] ="Jawahar Navodaya Vidyalaya";
  MyCode(MyText,'@');
  cout<<"MY TEXT:"<<MyText<<endl;
}

```

5) Write the output of the following program

```

#include<iostream.h>
void Withdef(int HisNum=22)
{ for(int I=20;I<=HisNum;I+=7)
  cout<<I<<" ";
  cout<<endl;
}
void Control(int &MyNum)
{ MyNum+=8;
  Withdef(MyNum);
}
void main()
{ int YourNum=20;
  Control(YourNum);
  Withdef( );
  cout<<"Number="<<YourNum<<endl;
}

```

6) Give the output of the following program:

```

#include<iostream.h>
struct Package
{ int Length,Breadth,Height;
};
void Occupies(Package M)
{ cout<<M.Length<<"x"<<M.Breadth<<"
x";
  cout<<M.Height<<endl;
}
void main( )
{ Package P1={5,10,15},P2,P3;
  ++P1.Height;
  Occupies(P1);
  P3=P1;
  ++P3.Breadth;
  P3.Height++;
  Occupies(P3);
  P2=P3;
  P2.Length+=25;
  --P2.Length;
  Occupies(P2);
}

```

7. Find the output of the following program

```

#include <iostream.h>
struct Game
{char Magic[20];int Score;
};
void main()
{ Game M={"Tiger",500};
  char *Choice;
  Choice=M.Magic;
  Choice[4]='P';
  Choice[2]='L';
  M.Score+=50;
}

```

```

cout<<M.Magic<<M.Score<<endl;
Game N=M;
N.Magic[0]='A';N.Magic[3]='J';
N.Score-=120;
cout<<N.Magic<<N.Score<<endl;
}

```

8) Find the output of the following program:

```

#include<iostream.h>
void main()
{ int A=7,B=9;
  for(int I=10;I<=11;I++)
  { cout<<"Line1"<<++A<<"&"<<B-1 <<endl;
    cout<<"Line2"<<B++<<"&"<<A +2 <<endl;
  }
}

```

9) Rewrite the following program after removing the syntactical error(s) if any. Underline each correction.

```

include<iostream.h>
void main( )
{ First = 10; Second = 20;
  Jumpto(First;Second);
  Jumpto(Second);
}
void Jumpto(int N1, int N2 = 20)
{ N1=N1+N2;
  count<<N1>>N2;
}

```

10) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction.

```

#include<iostream.h>
void main( )
{ struct movie
  { char movie_name[20];
    char movie_type;
    int ticket_cost=100;
  }MOVIE;
  gets(movie_name);
  gets(movie_type); }

```

11) Write the output for the following program.

```

#include<iostream.h>
#include<conio.h>
int g=20;
void func(int &x,int y)
{ x=x-y;
  y=x*10;
  cout<<x<<','<<y<<'\n';
}
void main()
{ int g=7;
  func(g,::g);
  cout<<g<<','<<::g<<'\n';
  func(,g,g);
  cout<<g<<','<<:g<<'\n';
}

```

12) Write the output of the following program.

```

#include<iostream.h>
static int i=100;

```

```
void abc()  
{ static int i=8;  
  cout<<"first ="<<i;  
}  
main()  
{ static int i=2;  
  abc();  
  cout<<"second ="<<i<<endl;  
}
```

13. What are Nested Structures? Give an example.
14. Differentiate between call by value and call by reference.
15. Explain type conversion.