

**Topics covered**

- 1) Classes and objects
- 2) Constructors and destructors
- 3) Inheritance
- 4) Review of class XI

1.Consider the following C++ declarations and answer the questions given below:-

```
class alpha
{
    int x,y;

    protected:
        void putvala( );
    public:
        void getvala( );
};
```

```
class beta : private alpha
{
    int m,n;
    protected:
        void getvalb( );
    public:
        void putvalb( );
```

```

};
class gamma : protected beta
{
    int a;
    public:
        void getdata( );
        void showdata( );
};

```

- i. Write the names of member functions, which are accessible from the object of class gamma.
- ii. Write the names of members, which are accessible from the member function of class beta.
- iii. Name the base class and derived class of class gamma.
- iv. Name the private member functions of class gamma.

2. Answer the questions (i) to (iv) based on the following :

```

class COMP
{ private :
    char Manufacturer [30];
char addr[15];

    public:
    toys( );
    void RCOMP( );
    void DCOMP( );
};
class TOY: public COMP
{ private:
    char bcode[10];
    public:
    double cost_of_toy;
    void RTOY ( );
    void DTOY( );
};

```

```

class BUYER: public TOY
{ private:
char
nm[30];

char delivery
date[10]; char
*baddr;

public:

void
RBUYER( );
void
DBUYER( );
};

void main ( )
{   BUYER MyToy;   }

```

1. Mention the member names that are accessible by MyToy declared in main( ) function.
2. Name the data members which can be accessed by the functions of BUYER class.
3. Name the members that can be accessed by function RTOY( ).
4. How many bytes will be occupied by the objects of class BUYER?

3. Answer the questions (i) to (iv) based on the following code **:(4)**

```

class Goods
{
    int id;
    protected :
    char
    name[20];
    long qty; void
    Incr(int n);
}

```

```

        public :
        Goods();
        ~Goods();
        void get();
};
class Food_products : protected Goods
{
    char
    exp_dt[10];
    protected :
    int
    id;
    int
    qty;
    publi
    c :
    void getd();
    void showd();
};
class Cosmetics : private Goods
{
    int qty;
    char exp_date[10];
    protected :
    int id;
    public :
    ~Cosmetics();
    Cosmetics();
    void show();
};

```

- (i) Name the all protected members of class Food\_products.

- (ii) Name the member functions accessible through the object of class Food\_products.
- (iii) From the following, Identify the member function(s) that cannot be called directly from the object of class Cosmetics
  - show()
  - getd()
  - get()
- (iv) If the class cosmetics inherits the properties of food\_products class also, then name the type of inheritance.

4. Consider the following declarations and answer the questions given below:

```

class Mydata
{
    protect
    ed: int
    data;
    public:
    void Get_mydata(int);
    void
    Manip_mydata(int);
    void Show_mydata(int);
    Mydata( );
    ~Mydata( );           };
class Personal_data
{
    protected:
    int data1;
    public:
    void Get_personaldata(int);
    void Show_personaldata(int);
    Mydata1( );
    ~Mydata1( );           };
class Person: public Mydata,
Personal_data {

```

```

public:
void Show_person(void);
person( );
~person( );          };

```

- i) How many bytes will be required by an object belonging to class Person?
- ii) Which type of inheritance is depicted in the above example?
- iii) List the data members that can be accessed by the member function Show\_person( )
- iv) What is the order of constructor execution at the time of creating an object of class Person?

5. Define a class named ADMISSION in C++ with the following descriptions:

**Private members:**

AD\_NO integer (Ranges 10 - 2000)

NAME Array of characters (String)

CLASS Character

FEES Float

**Public Members:**

Function Read\_Data ( ) to read an object of ADMISSION

type Function Display() to display the details of an object

Function Draw\_Nos ( ) to choose 2 students randomly.

And display the details. Use random function to generate admission nos. to match with AD\_NO.

6. Define a class **Employee** in C++ with the following specification:

**Private Members:**

ename an array of char of size[50] ( represent employee name)

deptname an array of char of size[20] ( represent department name)

salary integer ( represent total salary of an employee)

bonus float

CalBonus() This function calculate the total bonus given to an employee

according to following conditions

Deptname	Bonus
Accounts	4 % of salary
HR	5% of salary
IT	2% of salary
Sales	3% of salary
Marketing	4% of salary

**Public Members:**

Constructor to initialise ename and deptname to NULL and salary and bonus to 0.

A function read\_info to allow user to enter values for ename, deptname, salary & Call function CalBonus() to calculate the bonus of an employee.

A Function disp\_info() to allow user to view the content of all the data members

7..Define a class **Directory** with the following Specification:

**Private members:**

Docunames an array of string of size [10][25]

(to represent all the names of Documents inside Directory)

Freespace long ( to represent total number of bytes available in Directory)

Occupied long ( to represent total number of bytes used in Directory)

**Public members**

Newdocumentry( ) A function to accept values of Docunames, Freespace and Occupied from user.

Retfreespace( ) A function that returns the values of total kilobytes

available (1 Kilobyte= 1024 bytes) Showfiles ( ) A function that display the names of all the documents in

directory

8. Find the output of the following program:

- a. `#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;  
}`
- b. `#include<string.h>  
#include<iostream.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[ ]= " 15th August Celebrated";
    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;
}

```

```

c. #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;
```

```
d. #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;  
}
```

```
e. #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 = x.c + 10;
    y = z;
    y.c = y.c + ;
    y.r = y.r + 20;
    z.c = z.c - 15;
    display(x);
    display(y);
    display(z);
}

```

9. Rewrite the following program after removing the syntactical error , if any. Under line each correction.

```

i) #include<iostream.
   <iostream.h> const int Devidor
   5; void amin( )
   {
   Number=15; for(int count=1;
   count<=5;count++) if( Number/ Devidor= =
   0)
   cout<<Number/Devidor;
   cout<<endl; Else
   cout<< Number+Devidor<<endl;

```

```

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

```

```

void main ( )
{
int Numbers [Max];

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

```

10. In the following C++ program what is the expected value of Myscore from

a. `#include<stdlib.h>`  
`#include<iostream.`  
`h> void main( )`  
`{`  
`randomize();`  
`int Score[] = {25,20,34,56, 72, 63},`  
`Myscore; Myscore = Score[2 +`  
`random(2)]; cout<<Myscore<<endl; }`

(i) 25

(ii) 34

(iii) 20

(iv) None of the above

b. Observe the following program RANDNUM.CPP carefully. If the value of VAL entered by the user is 10, choose the correct possible output(s) from the options from i) to iv) and justify your option.

```

//program
RANDNUM.CPP
#include<iostream.h>
#include<stdlib.h>
#include<time.h>
void main()

```

```

    {
        randomize();
        int VAL, Rnd; int n=1;
        cin>>VAL;
        Rnd=8 + random(VAL) * 1;
        while(n<=Rnd)
        {
            cout<<n<< "\t";
            n++;
        }
    }

```

output  
options:

- i) 1 2 3 4 5 6 7 8 9 10 11 12 13
- ii) 0 1 2 3
- iii) 1 2 3 4 5
- iv) 1 2 3 4 5 6 7 8

11. Answer the questions i) and ii) after going through the following class :

```

#include<iostream.h>
#include<string.h>
#include<stdio.h>
class wholesale
{ char categ[20],item[30];
  float pr;
  int qty;

  wholesale( )           // Function 1
  { strcpy(categ
    ,"Food");
    strcpy(item,"Bisc
    uits");
    pr=150.00;

```

```

        qty=10 }
    public :
        void SHOW( )                //Function 2
        {
            cout<<categ<<"#"<<item<<":"<<pr<<"@"<<qty<<endl
            ;
        }
    };
    void main( )
    { wholesale ob;                //Statement 1
      ob.SHOW( );                  //Statement 2
    }

```

i) Will **statement 1** initialize all the data members for object **ob** with the values given in **function 1**?(Y/N). Justify your answer suggesting the corrections to be made in the above code.

ii) What shall be the possible output when the program gets executed? (Assuming, if required- the suggested correction(s) are made in the program.

12.. Answer the questions (i) and (ii) after going through the following program:

```

class Match
{int
  Time;
  public
  :
    Match() //Function 1
    {
        Time = 0;
        cout<<"Match commences "<<endl;

```

```

}
void Details() //Function 2
{
    cout<<"Inter Section Basketball Match"<<endl;
}
Match(int Duration) //Function 3
{
    Time = Duration;
    cout<<"Another match begins now"<<endl;
}
Match(Match &M) //Function 4
{
    Time = M.Duration;
    Cout<<"Like Previous Match"<<endl;
}
};

```

- i) Which category of constructor – Function 4 belongs to and what is the purpose of using it?
- ii) Write statements that would call the member Functions 1 and 3.

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