Sample Paper-2015
Subject: Computer Science
Class -XII

Time Allowed: 3 Hr. **M.M:70**

Q1.

(a) What is the function overloading? Explain example the term "default arguments". ? Give an example in C++ to illustrate both types. 2

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

```
void  main()
{
randomize();
int val= random(5);
char name ='F';
for (char ch= 'A'; ch<=name; ch=ch+2)
cout<<setw(4)<<name<<"\t"<<val;
}
```

(c).Rewrite the given snippet after removing the syntactical error(s), if any. Underline each correction 2

```
include<iostream.h>
        #define MAX 10
        void main()
        {       int AY[MAX]=(5,10,15,20,25);
                        const int loop 5;
                        for[int m=0; m<loop,m++]
                        switch(m):
                                {       case 0:
                                        case 4: cout<<AY[m]*5
                                        case 2:
                                        case 1 cout>>AY[m]>>endl;
                                }
        }
```

(d) Find the output of the following program (Assuming that all required header files are included) 2

```
#include <iostream.h>
        struct School
        {
                int year;
                float topper;
        };
        Void change( School *s, int  x=15)
{
        s->topper=(s->topper+25)-x;
        s->year++;
}
Void main()
{
School arr[]={{2012,170},{2012,75})
School *pointer=arr;
Change(pointer,150);
Cout<<arr[0].year<<"- "<<arr[0].topper<<endl;
Change(++pointer);
Cout<<pointer->year<<"- "<<pointer->topper<<endl;
}
```

(e) Find the output of the following program 3

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

```
#include <string.h>
#include <ctype.h>
void swap(char &c1,char &c2)
{       char temp;
temp=c1;
c1=c2;
c2=temp;
}
void update(char *str)
{
int k,j,l1,l2;
l1 = (strlen(str)+1)/2;
l2=strlen(str);
for(k=0,j=l1-1;k<j;k++,j--)
{
        if(islower(str[k]))
                swap(str[k],str[j]);
}
for(k=l1,j=l2-1;k<j;k++,j--)
{
        if(isupper(str[k]))
                swap(str[k],str[j]);
}
}
void main()
{
char data[100]={"bEsTOfLUck"};
cout<<"Original Data : "<<data<<endl;
update(data);
cout<<"Updated Data "<<data;
}
```

f) In the following program, find the correct possible output(s) from the options and justify your answer: **3**

```
#include <iostream.h>
#include <stdlib.h>
#include <string.h>
struct card {   char suit[10];
int digit;
    };
```

```
card* cards = new card[52];  // Allocate Memory
void createdeck()
{       char temp[][10] = {"Clubs","Spades","Diamonds","Hearts"};
int i,m=0,cnt=1;
for(i=1;i<=52;i++)
{       strcpy(cards[i].suit,temp[m]);
        cards[i].digit=cnt;
        cnt++;
        if(i % 13 == 0)
        { m++;  cnt=1;   }
}
}
card drawcard(int num)
{       int rndnum;
randomize();
rndnum = random(num)+1;
return (cards[rndnum]);
}
void main()
{       createdeck();
        card c;
        c = drawcard(39);
        if(c.digit > 10 || c.digit == 1)
        {
                switch(c.digit)
                {       case 11:cout<<"Jack of ";     break;
                        case 12:cout<<"Queen of ";  break;
                        case 13:cout<<"King of ";    break;
                        case 1:             cout<<"Ace of ";
                }
        }
        else
        cout<<c.digit<<" of ";
        cout<<c.suit;
        delete[] cards;     //Deallocate memory
}
```

Outputs:

i) Kind of Spades ii) Ace of Clubs

iii) Ace of Diamond iv) Queen of Hearts

Q2(a) What is the Data Abstraction and Data Hiding Concept ? 2

(b) Define a class Departmental with the following specification : 4

private data members

Prod_name string (45 charactes) [Product name]

Listprice long

Dis_Price long [Discount Price]

Net long [Net Price]

Dis_type char(F or N) [Discount type]

Cal_price() – The store gives a 10% discount on every product it sells. However at the time of festival season the store gives 7% festival discount after 10% regular discount. The discount type can be checked by tracking the discount type. Where 'F' means festival and 'N' means Non- festival .The Cal_price() will calculate the Discount Price and Net Price on the basis of the following table.

Product Name	List Price(Rs.)
Washing Machine	12000
Colour Television	17000
Refrigerator	18000
OTG	8000
CD Player	4500

public members

Constructor to initialize the string elements with "NULL", numeric elements with 0 and character elements with 'N'Accept() - Ask the store manager to enter Product name, list Price and discount type . The function will invoke Cal_price() to calculate Discount Price and Net Price .

ShowBill() - To generate the bill to the customer with all the details of his/her purchase along with the bill amount including discount price and net price.

(c) Answer the questions (i) and (ii) after going through the following program: 2

```
class Match
{
    int Time;
    public:
    Match()                                    //Function 1
    {
    Time=0;
    cout<<"Match commences"<<end1;
}
void Details()                                 //Function 2
    {
    cout<<"Inter Section Basketball Match"<<end1;
}

    Match(int Duration)                        //Function 3
    {
    Time=Duration;
    cout<<"Another Match begins now"<<end1;
```

```
    }
    Match(Match &M)                                    //Function 4
        {
        Time=M.Duration;
        cout<<"Like Previous Match "<<end1;
    }
};
```

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

(d) Answer the questions (i) to (iv) based on the following: 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;
Public:
Voidgetc ();
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 calleddirectly from the object of class Cosmetics
show()
getd()
get()

iv) If the class cosmetics inherit the properties of food_products class also,then name the type of inheritance.

Q3. (a) An array PP[20][25] is stored in the memory along the row with each of theelements occupying 4 bytes. Find out the memory location for the elementPP[13][20], if the element PP[7][10] is stored at memory location 3454.

(b) Write a function to print the product of each column of a two dimensional integer array passed as the argument of the function . 2

Ex. If the two dimensional array contains :
2 4 10
4 5 20
6 3 30
Then the output should appear as :
Product of col 1 = 48
Product of col 2 = 60
Product of col 3 = 600 2

(c) Convert the following infix expression to its equivalent postfix expression 2 showing stack status for the conversions :
A + B * (C-D) /(E-F)*H

(d) Write a function in C++ which accepts an integer array and its size as arguments and change all the even number with twice and odd with thrice. Example: if an array of five elements initially contains the element as.. 3
2,4,1,5,7
then the function should rearrange the array as
4,8,3,15,21

Q4 (a) Observe the program segment given below carefully and fill the blanks marked as Statement1 and Statement2 using read( ) and write ( ) functions for performing the required task. **1**

```
#include <fstream.h>
class Item
{
        int Imno; char Item[20];
        public:
        //Function to search and display the content from a particular record number
        void Search (int) ;
        //Function to modify the content of a particular record number
        void Modify(int);
};
        void Item :: Search (int RecNo)
        {
                fstream File;
                File.Open("STOCK.DAT" , ios :: binary | ios :: in);
                File.seekg(0,ios::beg);
                ------------------------------------        //statement 1
                Cout <<Ino <<" = = >" << Item << endl;
                File.close ( );
        }

        void Item :: Modify (int RecNo)
        {
                fstream File;
                File.open ("STOCK.DAT", ios ::binary | ios :: in | ios :: out);
                cin>> Ino;
                cin.getline(Itm,20 );
                File.seekp(RecNo);
```

```
----------------------------------- //Statement 2

        File.close ( );
    }
```

b) Write a function in c++ to count and transfer the those words which starting character is Capital Vowels present in FILE.TXT into temp.txt file? 2

FILE.TXT having the following contents :

Political satire is ridicule dedicated to Exposing the difference between Appearance and reality In public life.

c) Write a function in c++ to read and display the records of computers that cost more than Rs. 20000 from the binary file "COMP.DAT", assuming that the binary file is containing the objects of the following class : 3

```
class COMPUTER
{ int srno;
char model[25];
float price;
public:
float Retpr( ) { return price; }
void Enter( ){ cin>>srno>>price; gets(model); }
oid Display( ){ cout<<rno<<Name<<price<<endl;}
};
```

Q5 (a) What do you understand by Data Independence ? Illustrate with suitable example? 1

(b) Study the following tables STAFF and SALARY and write SQL commands for the question (i) to (iv) and give output for SQL queries (v) to (vi)

relation : STAFF

ID	NAME	DOJ	DEPT	SEX	QUALF
101	Siddharth	12/01/02	Sales	M	MBA
104	Raghav	8/05/88	Finance	M	CA
107	Naman	14/05/88	Research	M	MTECH
114	Nupur	1/02/03	Sales	F	MBA
109	Janvi	18/7/04	Finance	F	ICWA
105	Rama	14/4/07	Research	M	BTECH
117	Jace	27/6/87	Sales	F	MTECH
111	Binoy	12/1/90	Finance	M	CA
130	Samuel	7/3/99	Sales	M	MBA
187	Ragini	12/12/02	Research	F	BTECH

relation : SALARY

ID	BASIC	ALLOWANCE	COMM_PERC
101	15240	5400	3
104	23000	1452	4
107	14870	2451	3
114	21000	3451	14
109	24500	1452	10
105	17000	1250	2
117	12450	1400	3
111	13541	3652	9
130	25000	4785	15
187	14823	5862	2

i) Display the name of all CA's who are working for more than 5 years

ii) Display the number of staff joined year-wise

iii) Hike the Allowance of all female staff working in finance sector and joined the company before 2000

iv) Display the average salary given to the employee in each department

v) SELECT DEPT, COUNT(*) FROM STAFF WHERE SEX='m' GROUP BY DEPT HAVING COUNT(*) >2;

vi) SELECT AVG(BASIC+ ALLOWANCE), QUALF FROM SALARY S1, STAFF S2 WHERE S1.ID=S2.ID GROUP(QUALF) ;

vi) SELECT DISTINCT QUALF FROM STAFF;

viii) SELECT NAME, BASIC+ALLOWANCE FROM STAFF S, SALARY SA WHERE S.ID=SA.ID AND YEAR(DOJ)<2002 ;

6.(a) State and verify ***idempotent law with truth table***. **2**

(b) If F(w,x,y,z) = ∏ (0,3,4,5,6,7,8,11,12,15), obtain the simplified form using ***K-Map***. **3**

(c) Represent **AND** operation using **NOR** gate(s) only. **1**

(d) Write the ***SOP*** form of a Boolean function G, which is represented in a truth table as follows : **1**

A	B	C	R
0	0	0	**1**
0	0	1	**0**
0	1	0	**0**
0	1	1	**0**
1	0	0	**1**
1	0	1	**1**
1	1	0	**0**
1	1	1	**1**

(e) Draw the ***circuit diagram*** for the following Boolean expression : **1**

(A+B)(A'+B)(A+B')

Q7 (a) Define the term Bandwidth. Give any one unit of Bandwidth. 1

(b) Expand the following terms? 2

(i) CDMA
(ii) SGMA
(iii) TCP/IP
(iv) WAN

(c) What do you mean by Open Source Software? 1

(e) What is Modem? 1

(f) What is propriety software? Give one example? 1

7. a) Give the name of Two Cyber Laws**.** **1**

b) Expand ***CDMA and GSM*** **1**

c) What is the difference between free ware and share ware ? **1**

d) Define the term ***bandwidth.*** Write unit of bandwidth. **1**

e) The Ever Mind organization has set up its new branch at Amritsar for its office and web based activities. It has 4 wings of buildings which are as follows :

Center to center distances between various blocks

Wing X to Wing Z	40 m
Wing Y to Wing Z	60 m
Wing X to Wing Y	135 m
Wing Y to Wing U	70 m
Wing X to Wing U	165 m
Wing U to Wing Z	80 m

Number of computers

Wing X	50
Wing Y	130
Wing U	40
Wing Z	15

i) Suggest a most suitable cable layout of connection among the wings and topology. **1**

ii) Suggest the most suitable place to house the server of this organization with a suitable reason with justification.**1**

iii) Suggest the placement of the following devices with justification :a) Switch/Hub b) Repeater **1**

iv) The organization is planning to link its head office situated in Delhi with the offices as Amritsar. Suggest a way to Connectit; the cost is not the factor. **1**

(f) What is the difference between the MAN and WAN? 2