SAMPLE PAPER-2014
CLASS-XII
COMPUTER SCIENCE (C++)

Time allowed: 3 hours   *Maximum Marks: 70*

General Instruction

1.   Please check that this question paper contains 7 questions.
2.   Please write down serial number of the question before answering it.
3.   All questions are compulsory.
4.   Programming language : C++

Q1

(a)   How const differ from #define? Justify your answer with suitable Example?   2

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

```
void main( )

{

Int x=10, y=5;

char no[ ]="1234";

gotoxy(x,y);

cout<<atoi(no);

 }
```

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

```
#include "iostream.h"

class  manger

{

int m_id

float Fees;

PUBLIC:

void Register ( )

{cin>>Mno>>Fees;}

void Display( )

{cout<<Mno<<" : "<<Fees<<endl;}

};

void main()

{

MEMBER delete;

Register();

delete.Display();

}
```

(d)   What will be the output of the following program: 2

```cpp
#include<iostream.h>
#include<string.h>
void FUN(char *str)
{
int L,i,j;
L=strlen(str);
for(i=90;i>=65;i--)
for(j=0;j<L;j++)
if(str[j]==char(i)||str[j]==char(i+32))
cout<<str[j];
cout<<endl;
}
void main()
{
char *p="Christmas-2008";
FUN(p);
}
}
```

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

```cpp
#include<iostream.h>
#include<stdlib.h>
void main( )
{
        randomize( );
        int p=99,q=999;
        int x=random(3)+4;
        int y=random(2)+2;
        for(int i=0;i<x;i++)
        cout<<'#';
        cout<<p<<'-';
        for(i=0;i<y;i++)
        cout<<'@';
        cout<<q<<endl;
}
```

i)   ##99-@999
ii)   ##99-@@999
iii)   ######99-@@999
iv)   ####99-@@@999

(f)   Find the output of the following program   3

```
#include<iostream.h>
#include<ctype.h>
#include<conio.h>
#include<string.h>
void PointersFun(char Text[], int &count)
{
        char *ptr=Text;
        int length=strlen(Text);
        for(; count<length-2; count+=2, ptr++)
        {
                *(ptr + count) = toupper( * (ptr + count) );
        }
}
void main()
{
        clrscr();
        int position=0;
        char Data[]= "ChangeString";
        PointersFun(Data, position);
        cout<<Data<< "@"<< position;
        cout.write(Data + 3, 4);
}
```

Q2.   Answer the following questions.

(a)   What do you mean by virtual base class? How is it use full in programming?   **2**

(b)   Answer the questions (i) and (ii) after going through the following class: 2
class patient
{
        char disease[20];
        int age;
        public:
        patient ( )   //Constructor1
        {
                        strcpy(disease,"Cancer");
                        age=18;
        }
        patient (char *s, int a)   //Constructor2
        {
         strcpy(disease,s);
         age = a ;
        }

```
                patient (patient &p);              //Constructor3
                ~ patient ( )                      //Destructor
                {
                        cout<<"Memory Deallocate"; }
                };

        void main( )
        {
        patient p1("Fever",24);                           //Statement1
        patient p3(p1);                                   //Statement2
        }
        (i) When p3 object is created , which constructor will be invoked and why?
        (ii) Write complete definition for Constructor3
```

(c)   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.

    d)   Answer the questions (i) to (iv) based on the following code :   4
                class DRUG

```
                    { char catg[10];

                     char DOF[10], comp[20];

                    public:

                            DRUG( );

                            void endrug( );

                            void showdrug( );

                    };
```

```cpp
class TABLET
{
    protected:
        char tname[30],volabel[20];
    public:
        TABLET( );
        void entab( );
        void showtab( );
};
class PAINKILLER : protected DRUG ,  public TABLET
{
    int dose, usedays;
    long double * price;
    char seffect[20];
    public :
        void entpain( );
        void showpain( );
};
```

i)   How many bytes will be required by an object of PAINKILLER

ii)   Write names of all the member functions of class PAINKILLER.

iii)   Write names off all members accessible from object of class PAINKILLER.

iv)   Write names of all data members accessible from functions of class PAINKILLER.

Q.3

(a)   Suppose A,B,C are arrays of size m,n,m+n respectively. Array A is stored in ascending order and array B is in descending order. Write a function to receive 3 arrays and their sizes to store the elements of A and B into C in descending order.   (3)

(b)   An array M[-3…18][-8….37] is stored in the memory along the column with each of its elements occupying 8 bytes. Find   out the base address and the address of an element M[2][5], if the element M[5][10] is stored at address 4000.   (3)

(c)   Write a function in C++ which accepts a 2D array of integers, number of rows and number of columns as arguments and assign the elements which are divisible by 3 or 5   into a one dimensional array of integers.   (**3**)

If the 2D array is
$$\begin{bmatrix} 12 & 3 & 9 & 14 \\ 24 & 25 & 16 & 31 \\ 19 & 32 & 45 & 27 \\ 11 & 5 & 28 & 18 \end{bmatrix}$$

The resultant 1D arrays is **12 , 3 , 9 , 24 , 25 , 45 , 9 , 5 , 18**

(d) Write a function in C++ to insert and delete a node containing city's information (ie city name and its population) from a dynamically allocated Queue of cities. (4)

(e) Convert the following infix expression to its equivalent postfix expression Showing stack contents for the conversion: 2

(A+B)*(C^(D-E)+F)-G

Q4.

(a) Observe the program segment given below carefully , and answer the question that follows (1)

class Member

{   int Member_no ;

        char Member_name[20] ;

public :

         void enterdetails ( ) ;   //function to enter Member details

         void showdetails ( ) ;   //function to display Member details

         int RMember_no( )   //function to return Member_no

         {

                return Member_no ;}

         } ;

void Update (Member NEW)

{

   fstream File ;

   File.open("MEMBER.DAT" , ios :: binary l ios :: in l ios :: out) ;

   Member OM ;

   int Recordsread = 0, Found = 0 ;

   while (!Found && File.read((char*) & OM, sizeof(OM)))

   {   Recordsread++ ;

           if (NEW.RMember_no( ) == OM.RMember_no( ))

           { _____ // Statement 1

              _____ // Statement 2

             Found = 1 ;

           }

           else

                File.write((char*) & OM, sizeof(OM)) ;

   }

```
        if (!Found)

                cout<<"Record for modification does not exist" ;

        File.close( ) ;

    }
```

If the function Update( ) is supposed to modify a record in file MEMBER.DAT with the values of Member NEW passed to its argument, write the appropriate statements for statement1using seekp( ) or seekg( ) whichever needed, statement 2 using read( ) or write( ) method, whichever needed in the above code that would write the modified record at its proper place.

(b)   Assume a text file "coordinate.txt" is already created. Using this file create a C++ function to count the number of .words having first character capital.   (**2**)
   Example:

   Do less Thinking and pay more attention to your heart. Do Less Acquiring and pay more Attention to what you already have. Do Less Complaining and pay more Attention to giving. Do Less criticizing and pay more Attention to Complementing. Do less talking and pay more attention to SILENCE.

   Output will be : Total words are **16**

(c)   Given a binary file "AMOUNT.DAT",containing records of the given class outstand type.

   class outstand   **3**

   {

```
        int memno;

        int outamt;

    public:

        void getit()

        {      cin>>memno>>outamt;        }

        void putit()

        {      cout<<memno<<outamt;        }

        int returnamt()

        {      return outamt;          }

    };
```

Write a function in C++ to write objects having outamt more than Rs. 10,000 into CRITICAL.DAT file

Q 5.
(a)   What is the primary key and referential integrity ? why its necessary in RDBMS?

(b)   Consider the following tables Stationary and Consumer. Write SQL commands for the statement (i) to (iv) and output for SQL queries (v) to (viii):   6

Table: Stationary

S_ID	StationaryName	Company	Price
DP01	Dot Pen	ABC	10
PL02	Pencil	XYZ	6
ER05	Eraser	XYZ	7

| PL01 | Pencil | CAM | 5 |
| GP02 | Gel Pen | ABC | 15 |

Table: Consumer

C_ID	ConsumerName	Address	S_ID
01	Good Learner	Delhi	PL01
06	Write Well	Mumbai	GP02
12	Topper	Delhi	DP01
15	Write & Draw	Delhi	PL02
16	Motivation	Banglore	PL01

(i) To display the details of those consumers whose Address is Delhi.

(ii) To display the details of Stationary whose Price is in the range of 8 to 15. (Both Value included)

(iii) To display the ConsumerName, Address from Table Consumer, and Company and Price from table Stationary, with their corresponding matching S_ID.

(iv) To increase the Price of all stationary by 2.

(v) SELECT DISTINCT Address FROM Consumer;

(vi) SELECT Company, MAX(Price), MIN(Price), COUNT(*) from Stationary GROUP BY Company;

(vii) SELECT Consumer.ConsumerName, Stationary.StationaryName, Stationary.Price FROM Strionary, Consumer WHERE Consumer.S_ID=Stationary.S_ID;

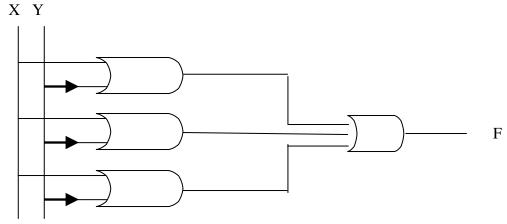(viii) Select StationaryName, Price*3 From Stationary;

Q6.

(a) State and verify Absorption and Demorgan's Law using truth table and algebraically.   2

(b) Verify the following algebraically and write the POS form   2
$(A'+B').(A+B)=A'.B+A.B'$

(c) Write the equivalent Boolean Expression for the following Logic Circuit

X   Y

F

(d) Reduce the following Boolean Expression using K-Map: 3

If $F(a,b,c,d) =\Sigma(0,1,3,4,5,7,8,9,11,12,13,15)$

(e) Convert the following Boolean expression into its equivalent Canonical Sum of Products form (SOP): $(X+Y+Z) (X+Y+Z') (X'+Y+Z) (X'+Y'+Z')$ 1

Q.7

(a) What is the difference between Packet Switching and Circuit Switching ?   1

(b) Differentiate the following :   1

(i) VoIP and Spread Spectrum Technique

(ii) FOSS and OSS.

(c) Explain the MODEM and GATEWAY .   1

(d)   Define and explain Cyber Law.   1

(e)   The Raideint Technology organization has set up its new branch at Kanpur 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/MODEM   1

iv) The organization is planning to link its head office situated in Delhi with the offices as Kanpur. Suggest a way to connect it, the cost is not the factor.   1

(f)   What is difference between the web address and URL?   1

(g)   What is the difference between the VIRUS and Trojan   1

Best of Luck for your Board Examination 2014…….

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