Sample Paper -2015
Sub:Computer Science
Class – XII

Time: 3Hours   **Maximum Marks: 70**

Note.   (i) All questions are compulsory.

 (ii) Programming Language: C++

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

1.**(b)** Which C++ header file(s) will be 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

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

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

```cpp
#include <iostream.h>
class Book
        {
      Long Bid,Qty;
      Public:
              void Purchase(){cin>>Bid>>Qty;}
              void Sale{cout<<setw(5)<<Bid<<"Old:"<<Qty<<endl;  }};
    void main()
      {
              Book B;
              B.Purchase();
              B.Sale()
              Sale.B();
              Sale();
      }
```

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

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

class Metro
{
 int Mno,TripNo,PassengerCount;
public:
Metro(int Tmno=1)
 {
Mno=Tmno;
TripNo=0;
PassengerCount=0;
}
void Trip(int PC=20)
{
TripNo++;
PassengerCount+=PC;}
void StatusShow()
```

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```
        {
        cout<<Mno<<":"<<TripNo<<":"<<PassengerCount<<endl;}
         } ;
        void main()
        {
         Metro M(5),T;
         M.Trip();
        T.Trip(50);
         M.StatusShow();
        M.Trip(30);
         T.StatusShow();
         M.StatusShow();
        }
```

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

```
        #include<iostream.h>
        #include<conio.h>
        #include<ctype.h>
        typedef char Str80[80];
        void main()
        {
        clrscr();
        char *Notes;
        Str80 Str="vR2GooD";
         int L=6;
         Notes=Str;
        while(L>=3)
         {
          Str[L]=(isupper(Str[L])?tolower(Str[L]):toupper(Str[L])) ;
         cout<<Notes<<endl;
         L--;
        cout<<L;
        Notes++;
        cout<<Notes;
        }
        }
```

1.(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?

2

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

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

2 (a) What do you understand by Data Encapsulation and Data Hiding? Also, give a suitable C++ code to illustrate both.   2

2 (b) Answer the questions (i) and (ii) after going through the following class: 2

```
class Travel
{
int PlaceCode;char Place[20];float Charges;
public: Travel()                                          //Function 1
{
PlaceCode=1; strcpy (Place,"DELHI"); Charges=1000;
}
void TravelPlan(float C)                                  //Function 2
{
cout<<PlaceCode<<":"<<Place<<":"<<Charges<<endl;
}
~Travel()                                                 //Function 3
{
Cout<<"Travel Plan Cancelled"<<endl;
}
Travel (int PC,char P[],float C)                          //Function 4
{
PlaceCode=PC;strcpy(Place,P);Charges=C;
}
};
```

i) In Object Oriented Programming, what are **Function 1** and **Function 4** combined together referred as?
ii) In Object Oriented Programming, which concept is illustrated by **Function 3**? When is this function called/invoked?

2(c) Define a class **SUPPLY** in C++ with following description: 4
Private Members:
• Code of type integer
• FoodName of type string
• Sticker of type string
• FoodType of type string
• A member function GetType() to assign the following values for FoodType as per the given Sticker:

Sticker	FoodType
GREEN	Vegetarian
YELLOW	Contains Egg
RED	Non-Vegetarian

Public Members:
• A function FoodIn() to allow user to enter values for Code,FoodName,Sticker and call function GetType ( ) to assign   respective FoodType.
• A function FoodOut () to allow user to view the content of all the data members..
2(d) Answer the questions (i) to (iv) based on the following: 4

class **PUBLISHER**
{
char Pub[12];

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double Turnover;
protected:
void Register();
public:
PUBLISHER();
void Enter();
void Display();
};
class **BRANCH**
{
char CITY[20];
protected:
float Employees;
public:
BRANCH();
void Haveit();
void Giveit();
};
class **AUTHOR** : private BRANCH , public PUBLISHER
{
int Acode;
char Aname[20];
float Amount;
public:
AUTHOR();
void Start();
void Show();
};
(i) Write the names of data members, which are accessible from objects belongingto class AUTHOR.
(ii) Write the names of all the member functions which are accessible from objectsbelonging to class BRANCH.
(iii) Write the names of all the members which are accessible from member functionsof class AUTHOR.
(iv) How many bytes will be required by an object belonging to class AUTHOR?

3 (a) Write a function SWAP2BEST(int ARR[ ],int Size) in C++ to modify the content of the array in such a way that the elements,which are multiples of 10 swap with the value present in the very next position in the array.
ForExample: If the content of array ARR is

90 ,56 , 45, 20 ,34 ,54

The content of array ARR should become

   56 , 90 , 45 ,34 ,20 ,54   3

3(b) An array V[40][10] is stored in the memory along the column with each of the element occupying 4 bytes, Find out the address of the location V[3][6] if the location V[30][10] is stored at the address 9000.

                                                                              3

3(c) Write a function in C++ to perform Insert operation in static circular Queue containing Players information (represented with the help of an array of structure PLAYER).   4

        struct PLAYER
        {
        long PID ;   // Player ID
        char Pname [20] ;   // Player Name
        };
3(d) Write a function TRANSFORM (int A[ ][3],int N,int M) in C++ to swap the elements of first and last row.

                                                                              2

3(e) Evaluate the following POSTFIX notation. Show status of Stack after every step of evaluation (i.e., after each operator)

32, 4, /, 2, *, 12, 3, -, +   2

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4. (a) Observe the program segment given below carefully and answer the question that follows:

1

```cpp
# include<fstream.h>
class Book
{
            int Bno ; char Title [20] ;
      public :
            void EnterVal () { cin >> Bno ; cin.getline ( Title, 20); }
            void showVal () { cout << Bno << "#" << Title << end l ; }
} ;
void Search ( int RecNo)
{
      fstream File ;Book B ;
      File. open ( "BOOK.DAT", ios : : binary | ios : : in) ;
      _____                  //  Statement 1
      File. read (( char*) &B, sizeof (B) ) ;
      B.Show();File.close();
}
void Modify(int RecNo)
{
 fstream File;Book B;
File.open("BOOK.DAT",ios::binary| ios::in |ios :out);
B.EnterVal( );
_____  //Statement 2
File.write((char *)&B,sizeof(B));

File.close();
}
```

   (i)   Write statement 1 to position the file pointer to the beginning of the desired record to be read, which
           is sent as parameter of the function (assuming RecNo1 stands for the first record)
   (ii)   Write statement 2 to position the file pointer to the beginning of the desired record to be modified,
           which is sent as parameter of the function (assuming RecNo1 stands for the first record).

4(b) Write a function in C++to count the word "this"(including "This"/"THIS" too) present in a text file
"DIARY.TXT".   2

4(C) Write a function in C++ to search for a Toy having a particular ToyCode from a binary file "TOY.DAT"
and display its details (Tdetails),assuming the binary file is containing the objects of the following class.

3

```cpp
 class TOYSHOP
 {
 int Tcode;    //Toy Code
   char Tdetails[20];
   public:
int RTcode( ) {      return Tcode;    }
         void AddToy( ) {       cin>>Tcode;gets(Tdetails);}
         void DisToy ( ) {      cout<<Tcode<<Tdetails<<endl; }

 };
```

5. (a) What do you understand by Degree and Cardinality of a table?   2

5.(b) Consider the following tables **ACTIVITY** and **COACH**. Write SQL commands for the statements (i) to
(iv) and give outputs for SQL queries (v) to (viii)

Table: ACTIVITY

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ACode	ActivityName	ParticipantsNum	PrizeMoney	ScheduleDate
1001	Relay 100x4	16	10000	23-Jan-2004
1002	High jump	10	12000	12-Dec-2003
1003	Shot Put	12	8000	14-Feb-2004
1005	Long Jump	12	9000	01-Jan-2004
1008	Discuss Throw	10	15000	19-Mar-2004

Table: COACH

PCode	Name	ACode
1	Ahmad Hussain	1001
2	Ravinder	1008
3	Janila	1001
4	Naaz	1003

(i)   To display the name of all activities with their Acodes in descending order.
(ii) To display sum of PrizeMoney for each of the Number of participants groupings (as shown in column ParticipantsNum 10,12,16)
(iii)   To display the coach's name and ACodes in ascending order of ACode from the table COACH.
(iv)To display the content of the GAMES table whose ScheduleDate earlier than 01/01/2004 in ascending order of ParticipantNum.
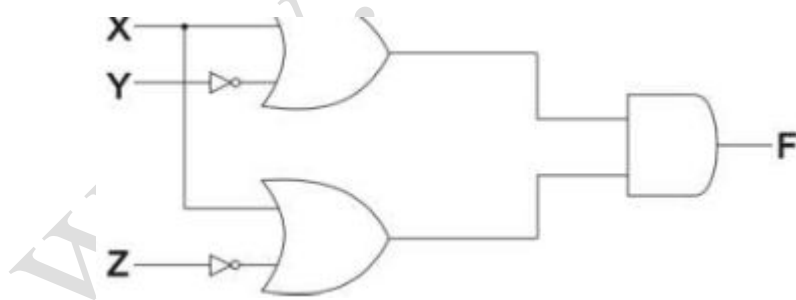
(v)   SELECT COUNT(DISTINCT ParticipantsNum) FROM ACTIVITY;
(vi)   SELECT MAX(ScheduleDate),MIN(ScheduleDate) FROM ACTIVITY;
(vii)   SELECT SUM(PrizeMoney) FROM ACTIVITY;
(viii)   SELECT DISTINCT ParticipantNum FROM COACH;   6

6.(a) State and verify De Morgan's Lawsusing truth table.   2

6.(b) Write the equivalent Boolean Expression for the following Logic Circuit.

6.(c) Write the SOP and POS form of a Boolean function R, which is represented in a truth table as follows:

1

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

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1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

6.(d) Reduce the following Boolean expression using k-map:

3

F(A,B,C,D)=∑(0,1,2,4,5,8,9,10,11)

7. (a) What out of the following, will you use to have an audio- visual chat with an expert sitting in a far-away place to fox-up a technical issue?

1

i)   VoIP
ii) email
iii) FTP

7.(b) Name one server side scripting language and one client side scripting language.

1

7. (c) Which out of the following comes under Cyber Crime?

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   i)   Operating someone's Internet banking accounting, without his knowledge.
   ii) Stealing a keyboard from someone's computer.
   iii) Working on someone's computer with his/her permission.
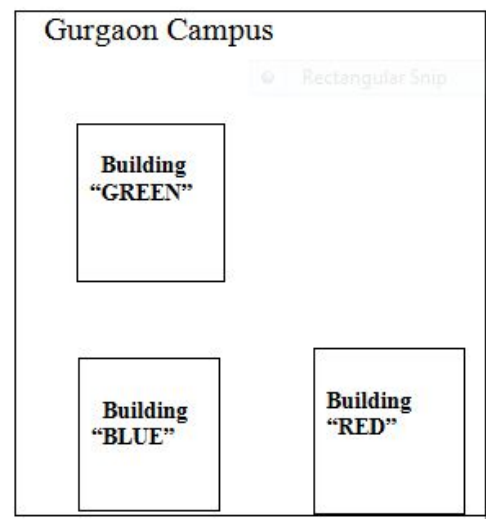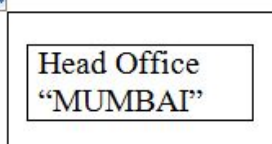
7.(d) Write one advantage of Bus Topology of network. Also, illustrate how 4 computers can be   connected with each other using star topology of network.   1

7. (e) Workalot Consultants are setting up a secured network for their office campus at Gurgaon for their day-to-day office and web-based activities. They are planning to have connectivity between 3 buildings and the head office situated in Mumbai.

Answer the questions (i) to (iv) after going through the building position in the campus and other details, which are given below: 4

```
┌──────────────────┐
│ Head Office      │
│ "MUMBAI"         │
└──────────────────┘
```

```
Gurgaon Campus
           Rectangular Snip
    ┌──────────┐
    │ Building │
    │ "GREEN"  │
    └──────────┘

    ┌──────────┐   ┌──────────┐
    │ Building │   │ Building │
    │ "BLUE"   │   │ "RED"    │
    └──────────┘   └──────────┘
```

Distance between various buildings   **Number of Computers**

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Building "GREEN" to "RED"	110m	Building "GREEN"	32
Building "GREEN" to "BLUE"	45m	Building "RED"	150
Building "BLUE" to "RED"	65m	Building "BLUE"	45
Gurgaon Campus to Head Office	1760m	Head Office	10

i) Suggest the most suitable place (i.e. building) to house the server of this organization. Also give a reason to justify your suggested location.
ii) Suggest a cable layout of connections between the buildings inside the campus.
iii) Suggest the placement of the following devices with justification:
1) Switch
2) Repeater
iv) The organization is planning to provide a high speed link with its head office situated in MUMBAI using a wired connection. Which of the following cables will be most suitable for this job?
1) Optical Fibre
2) Co- axial Cable
3) Ethernet Cable

   f) Give one suitable example of each URL and Domain Name.   1

   g) Name two Proprietary software's along with their application.   1

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