LR DAV PUBLIC SCHOOL
SAMPLE PAPER
CLASS – XI
COMPUTER SCIENCE

Time : 2 Hrs Maximum Marks : 50

- Please check that question paper contains 5 No.of Questions.
- Please write down the serial number of the question before attempting it.
- Attempt all parts of particular question together.

General Instructions

(i) All questions are compulsory.
(ii) Programming language is C++.

1.

a) Explain in brief the purpose of function prototype with the help of a suitable example. 2

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);
}
```

c) Deepa has just started working as a programmer in STAR SOFTWARE Company. In the company she has got her first assignment to be done using a C++ function to find the smallest number out of a given set of numbers stored in a one-dimensional array. But she has committed some logical mistakes while writing the code and is not getting the desired result. Rewrite the correct code underlining the corrections done. Do not add any additional statements in the corrected code. 2

```
int find(int a[],int n)
{    int s=a[0];
    for(int x=1;x<n;x++)
    if(a[x]>s)
        a[x]=s;
    return(s);
}
```

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}, P;
    Play(G,10);
    P = G;
```

```
    cout<<G.Score<<":"<<G.Bonus<<endl;
    Play(P, 12);
    Play(G);
    cout<<G.Score<<":"<<G.Bonus<<endl;
    Play(G,15);
    cout<<P.Score<<":"<<P.Bonus<<endl;
}
```

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]=='N'||Msg[cnt]=='n'||Msg[cnt]==' ')
                Msg[cnt]=CH;
        else
            if(cnt%2==0)
                Msg[cnt]=toupper(Msg[cnt]);
            else
                Msg[cnt]=Msg[cnt–1];
} }
void main()
{   char MyText[]="Input Raw";
    Mycode(MyText,'@');
    cout<<"NEW TEXT:"<<MyText<<endl;
 }
```

f) Study the following program and select the possible output(s) from the options (i) to (iv) following it. Also, write the maximum and the minimum values that can be assigned to the variable VAL. 2

Note :

– Assume all required header files are already being included in the program.

```
void main()
{   randomize();
    int VAL;
    VAL=random(3)+2;
    char GUESS[]="ABCDEFGHIJK";
    for (int I=1;I<=VAL; I++)
    {   for(int J=VAL; J<=7;J++)
        cout<<GUESS[J];
        cout<<endl;
    }
}
```

(i)	(ii)	(iii)	(iv)
BCDEFGH	CDEFGH	EFGH	FGHI
BCDEFGH	CDEFGH	EFGH	FGHI
		EFGH	FGHI

EFGH FGHI

2.

a) What is function overloading? Name the OOP concept implemented by function overloading? Give an example in C++ to illustrate the same. 2

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

```
class Seminar
{
    int Time;
    public:
    Seminar()                    //Function 1
    {   Time=30;cout<<"Seminar starts now"<<endl;    }
    void Lecture()          //Function 2
    {   cout<<"Lectures in the seminar on"<<endl;     }
    Seminar(int Duration)        //Function 3
    {   Time=Duration;cout<<"Seminar starts now"<<endl;    }
    ~Seminar()                   //Function 4
    {   cout<<"Vote of thanks"<<endl;      }
};
```

i) In Object Oriented Programming, what is Function 4 referred as and when does it get invoked/called?

ii) In Object Oriented Programming, which concept is illustrated by Function 1 and Function 3 together? Write an example illustrating the calls for these functions.

c) Write the definition of a class **PIC** in C++ with following description : 4

Private Members

- Pno //Data member for Picture Number (an integer)
- Category //Data member for Picture Category (a string)
- Location //Data member for Exhibition Location (a string)
- FixLocation //A member function to assign Exhibition Location as
  //per category as shown in the following table

Category	Location
Classic	Amina
Modern	Jim Plaq
Antique	Ustad Khan

Public Members

- Enter() //A function to allow user to enter values Pno, category and call
  //FixLocation() function
- SeeAll() //A function to display all the data members

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

```
class Exterior
{   int OrderId;
    char Address[20];
     protected:
    float Advance;
     public:
    Exterior();
    void Book();
    void View();
```

```
};
class Paint:
 {
    int WallArea,ColorCode;
     protected:
    char Type;
     public:
    Paint();
    void PBook();
    void PView();
};
class Bill : public Paint, Exterior
{
    float Charges;
    void Calculate();
     public :
    Bill();
    void Billing();
    void Print();
};
```

(i) Which type of Inheritance out of the following is illustrated in the above example?

(ii) Write the names of all the data members, which are directly accessible from the member functions of class Bill.

(iii) Write the names of all the members, which are directly accessible from an object of class Bill.

(iv) What will be the order of execution of the constructors, when an object of class Bill is declared?

3.

a) Write a function in C++ to merge the contents of two sorted arrays A & B into third array C. Assuming array A is sorted in ascending order, B is sorted in descending order, the resultant array is required to be in ascending order. 3

b) A two dimensional array P[20] [50] is stored in the memory along the row with each of its element occupying 4 bytes, find the address of the element P[10] [30], if the element P[5] [5] is stored at the memory location 15000. 3

c) Write a function REVCOL (int P[] [5], int N, int M) in C++ to display the content of a two dimensional array, with each column content in reverse order. 2
Note : Array may contain any number of rows.

For example, if the content of array is as follows :

15	12	56	45	51
13	91	92	87	63
11	23	61	46	81

The function should display output as :

11	23	61	46	81
13	91	92	87	63
15	12	56	45	51

4.

a) Observe the following table carefully and write the names of the most appropriate columns, which can be considered as (i) candidate keys and (ii) primary key. 2

Id	Product	Qty	Price	Transaction Date
101	Plastic Folder 12"	100	3400	2014-12-14
104	Pen Stand Standard	200	4500	2015-01-31
105	Stapler Medium	250	1500	2015-02-02
109	Punching Machine Big	200	1400	2015-03-12
103	Stapler Mini	100	1500	2015-02-02

b) Consider the following DEPT and WORKER tables. Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii) : 6

Table : DEPT

DCODE	DEPARTMENT	CITY
D01	MEDIA	DELHI
D02	MARKETING	DELHI
D03	INFRASTRUCTURE	MUMBAI
D05	FINANCE	KOLKATA
D04	HUMAN RESOURCE	MUMBAI

Table : WORKER

WNO	NAME	DOJ	DOB	GENDER	DCODE
1001	George K	2013-09-02	1991-09-01	MALE	D01
1002	Ryma Sen	2012-12-11	1990-12-15	FEMALE	D03
1003	Mohitesh	2013-02-03	1987-09-04	MALE	D05
1007	Anil Jha	2014-01-17	1984-10-19	MALE	D04
1004	Manila Sahai	2012-12-09	1986-11-14	FEMALE	D01
1005	R SAHAY	2013-11-18	1987-03-31	MALE	D02
1006	Jaya Priya	2014-06-09	1985-06-23	FEMALE	D05

Note : DOJ refers to date of joining and DOB refers to date of Birth of workers.

(i) To display Wno, Name, Gender from the table WORKER in descending order of Wno.

(ii) To display the Wno and Name of those workers from the table WORKER who are born between '1987-01-01' and '1991-12-01'.

(iii) To insert a new record: (1008, Amratya Saha, 2014-01-10, 1991-12-12, MALE, D04)

(iv) To count and display number of MALE and number of FEMALE workers who have joined after '1986-01-01'.

(v) SELECT COUNT(*), DCODE FROM WORKER GROUP BY DCODE HAVING COUNT(*)>1;

(vi) SELECT DISTINCT DEPARTMENT FROM DEPT;

(vii) SELECT NAME, DEPARTMENT, CITY FROM WORKER W,DEPT D WHERE W.DCODE=D.DCODE AND WNO<1003;

(viii) SELECT MAX(DOJ), MIN(DOB) FROM WORKER;

5.

a) Verify the following using Boolean Laws. 2

X + Y' = X.Y+X.Y'+X'.Y'

b) Draw the Logic Circuit (using NAND gates only) for the following Boolean Expression: 2

(U + V').W' + VZ

c) Derive a Canonical POS expression for a Boolean function F, represented by the following truth table: 1

A	B	C	F(A,B,C)
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

d) Reduce the following Boolean Expression to its simplest form using K-Map: 3
F(X,Y,Z,W) = Σ(0,1,6,8,9,10,11,12,15)

e) Prove Demorgan's Law by using truth table. 2