DELHI PUBLIC SCHOOL, RUBY PARK, KOLKATA

CLASS XII

SUBJECT: COMPUTER SCIENCE

QUESTION BANK

FILE HANDLING:-

1. Write a function in C++ to count and display the number of lines not starting with alphabet 'A' present in a text file "STORY.TXT".
Example:
If the file "STORY.TXT" contains the following lines,
The rose is red.
A girl is playing there.
There is a playground.
An aeroplane is in the sky.
Numbers are not allowed in the password.

2. Assuming that a text file named FIRST.TXT contains some text written into it, write a function named vowelwords(), that reads the file FIRST.TXT and creates a new file named SECOND.TXT, to contain only those words from the file FIRST.TXT which start with a lowercase vowel (i.e., with 'a', 'e', 'i', 'o', 'u').
For example, if the file FIRST.TXT contains
Carry umbrella and overcoat when it rains
Then the file SECOND.TXT shall contain
umbrella and overcoat it.

3. Observe the program segment given below carefully and fill the blanks marked as Statement 1 and Statement 2 using seekg() and tellg() functions for performing the required task.

```
#include <fstream.h>
class Employee
{
        int Eno;
        char Ename[20];
        public:
        //Function to count the total number of records
        int Countrec();
};
```

```
int Item::Countrec()
{
        fstream File;
        File.open("EMP.DAT", ios::binary | ios::in);
        __ ___ ____ ___ __ //Statement 1
        int Bytes =___ __ __ _ //Statement 2
        int Count = Bytes / sizeof(Item);
        File.close();
        return Count;
}
```

4. Observe the program segment given below carefully and fill the blanks marked as Statement 1 and Statement 2 using seekp() and seekg() functions for performing the required task.

```
#include <fstream.h>
class Item
{
        int Ino;
        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);
        ___ ___ ____ ___ //Statement 1
        File.read((char*)this, sizeof(Item));
        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(Item, 20);
```

```
    ___ ____ ____ ____ //Statement 2
    File.write( (char*)this, sizeof(Item));
    File.close();
}
```

ARRAY:-

1. Write a menu driven C++ program with following option
a. Accept elements of an array
b. Display elements of an array
c. Sort the array using insertion sort method
d. Sort the array using selection sort method
e. Sort the array using bubble sort method
Write C++ functions for all options. The functions should have two parameters name of the array and number of elements in the

2. Given two arrays of integers A and B of sizes M and N respectively. Write a function named MIX () with four arguments, which will produce a third array named C. such that the following sequence is followed.
All even numbers of A from left to right are copied into C from left to right.
All odd numbers of A from left to right are copied into C from right to left.
All even numbers of B from left to right are copied into C from left to right.
All old numbers of B from left to right are copied into C from right to left.
A, B and C are passed as arguments to MIX (). e.g., A is {3, 2, 1, 7, 6, 3} and B is {9, 3, 5, 6, 2, 8, 10} the resultant array C is {2, 6, 6, 2, 8, 10, 5, 3, 9, 3, 7, 1, 3}

3. Write a user defined function named Upper-half() which takes a two dimensional array A, with size N rows and N columns as argument and prints the upper half of the array.

e.g.,

```
2 3 1 5 0                    2 3 1 5 0
7 1 5 3 1                      1 5 3 1
2 5 7 8 1   The output will be   1 7 8
0 1 5 0 1                        0 1
3 4 9 1 5                          5
```

4. Write a function in C++ which accepts a 2D array of integers and its size as arguments and displays the elements of middle row and the elements of middle column.
[Assuming the 2D Array to be a square matrix with odd dimension i.e. 3x3, 5x5, 7x7 etc...]
Example, if the array contents is

```
3 5 4
7 6 9
2 1 8
```

Output through the function should be :
Middle Row : 7 6 9
Middle column : 5 6 1

4. An array A [40][10] is stored in the memory along the column with each elements occupying 4 bytes. Find out the address of the location A [3][6] if the location A [30][10] is stored at the address 9000.

DATA STRUCTURE:-

1. Use a stack to evaluate the following postfix expression and show the content of the stack after execution of each operation. Don't write any code. Assume as if you are using push and pop member functions of the stack.

AB-CD+E*+ (where A=5, B=3, C=5, D =4, and E=2)

2. Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation :

50,40,+,18, 14,-, *,+

3. Write a function in C++ to perform a DELETE operation in a dynamically allocated queue considering the following description :

```
struct Node
{
        float U,V;
        Node *Link;
};
class QUEUE
{
        Node *Rear,*Front;
public:
        QUEUE(){Rear=NULL; Front=NULL;}
        void INSERT();
        void DELETE();
        ~QUEUE();
};
```

INHERITANCE:-

1. Consider the following declaration and answer the questions given below :

class PPP

```
{
   int H:
  protected :
   int S;
  public :
   void input (int);
   void out();
};

class QQQ : private PPP
{
   int T;
  protected :
   int U;
  public :
   void indata(int, int);
   void outdata();
};

class RRR : public QQQ
{
   int M;
  public :
   void disp();
};
```

i. Name the base class and derived class of the class **QQQ**.
ii. Name the data member(s) that can be accessed from function **disp()**.
iii. Name the member function(s), which can be accessed from the objects of class **RRR**.
iv. Is the member function **out()** accessible by the object of the class **QQQ?**

2. class Publisher

```
{
   char pub[12];
   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 belonging to class **Author**.
ii. Write the names of all the member functions which are accessible from objects belonging to class **Branch**.
iii. Write the names of all the members which are accessible from member functions of class **Author**.
iv. How many bytes will be required by an object belonging to class **Author**?

CLASS & OBJECT:-

1. Define a class batsman with the following specifications:

Private members:

bcode	4 digits code number
bname	20 characters
innings, notout, runs	integer type
batavg	it is calculated according to the formula – batavg =runs/(innings-notout)
calcavg()	Function to compute batavg

Public members:

readdata()	Function to accept value from bcode, name, innings, notout and invoke the function calcavg()
displaydata()	Function to display the data members on the screen.

2. Define a class in C++ with following description:

Private Members

A data member Flight number of type integer

A data member Destination of type string

A data member Distance of type float

A data member Fuel of type float

A member function CALFUEL() to calculate the value of Fuel as per the following criteria

Distance	Fuel
<=1000	500
more than 1000 and <=2000	1100
more than 2000	2200

Public Members

A function FEEDINFO() to allow user to enter values for Flight Number, Destination, Distance & call function CALFUEL() to calculate the quantity of Fuel

A function SHOWINFO() to allow user to view the content of all the data members

2. Define a class BOOK with the following specifications :

Private members of the class BOOK are

BOOK NO integer type

BOOKTITLE 20 characters

PRICE float (price per copy)

TOTAL_COST() A function to calculate the total cost for N number of copies where N is passed to the function as argument.

Public members of the class BOOK are

INPUT() function to read BOOK_NO. BOOKTITLE, PRICE

PURCHASE() function to ask the user to input the number of copies to be purchased. It invokes TOTAL_COST() and prints the total cost to be paid by the user.

CONSTRUTOR & DESTRUCTOR:-

1. Answer the questions (i) and (iii) after going through the following class:

```
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 << "Thanks" << endl;
    }
};
```

i. Write statements in C++ that would execute Function 1 and Function 3 of class Seminar.

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

iii. In Object Oriented Programming, which concept is illustrated by Function 1 and Function 3 together?

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

```
class Test
{
   char paper[20];
   int marks;
public:
   Test ()    // Function 1
   {
      strcpy (paper, "Computer");
      marks = 0;
   }

   Test (char p[])    // Function 2
   {
      strcpy(paper, p);
      marks = 0;
   }

   Test (int m)    // Function 3
   {
      strcpy(paper,"Computer");
      marks = m;
   }

   Test (char p[], int m)    // Function 4
   {
      strcpy (paper, p);
```

```
        marks = m;
    }
};
```

i. Write statements in C++ that would execute Function 1, Function 2, Function 3 and Function 4 of class Test.

ii. Which feature of Object Oriented Programming is demonstrated using Function 1, Function 2, Function 3 and Function 4 together in the above class Test?

Boolean Algebra:-

1. Verify the following using Boolean Law algebraically

A'+ B'.C=A'.B'.C'+ A'.B.C'+ A'.B.C + A'.B'.C+ A.B'.C

2. Implement the following expression using logic circuit diagram

AB'C + ABC + A'C (B+CA')

3. Derive a Canonical POS expression for a Boolean function F, represented by the following truth table :

P	Q	R	F(P, Q, R)
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0

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

4.Reduce the following Boolean Expression to its simplest form using K-Map :

F(X,Y,Z,W) = Σ(2,6,7,8,9,10,11,13,14,15)

5. State the absorption law and prove it by using truth table.

DATABASES:-

1. 1. Write SQL queries for (i) to (iv) which are based on the following tables

Table : VEHICLE

CODE	VTYPE	PERKM
101	VOLVO BUS	160
102	AC DELUXE BUS	150
103	ORDINARY BUS	90
105	SUV	40

104	CAR	20

Table : TRAVEL

NO	NAME	TDATE	KM	CODE	NOP
101	Janish Kin	2015-11-13	200	101	32
103	Vedika Sahai	2016-04-21	100	103	45
105	Tarun Ram	2016-03-23	350	102	42
102	John Fen	2016-02-13	90	102	40
107	Ahmed Khan	2015-01-10	75	104	2
104	Raveena	2016-05-28	80	105	4

106	**Kripal Anya**	**2016-02-06**	**200**	**101**	**25**

1.To display NO, NAME, TDATE from the table TRAVEL in descending order of NO.

Q1. To display the NAME of all the travellers from the table TRAVEL who are travelling by vehicle with code 101 or 102.

Q2. To display the NO and NAME of those travellers from the table TRAVEL who travelled between '2015-12-31' and '2015-04-01'.

Q3. To display all the details from table TRAVEL for the travellers, who have travelled distance more than 100 KM in ascending order of NOP.

Q4. To display all the details from table VEHICLE whose vehicles type starting with V and ending with S.

2. Consider the following tables WORKER and PAYLEVEL and answer (b) and (c) parts of this question:

Table: WORKER

ECODE	NAME	DESIG	PLEVEL	DOJ	DOB
11	Radhe Shyam	Supervisor	P001	13-Sep-2004	23-Aug-1981
12	Chander Nath	Operator	P003	22-Feb-2010	12-Jul-1987
13	Fizza	Operator	P003	14-Jun-2009	14-Oct-1983
15	Ameen Ahmed	Mechanic	P002	21-Aug-2006	13-Mar-1984

18	Sanya	Clerk	P002	19-Dec-2005	09-Jun-1983

Table: PAYLEVEL

PLEVEL	PAY	ALLOWANCE
P001	26000	12000
P002	22000	10000
P003	12000	6000

(b)Write SQL commands for the following statements:

(i) To display the details of all WORKERs, descending order of DOB.

(ii) To display NAME and DESIG of those WORKERs whose PLEVEL is either P001 or P002.

(iii)To display the content of all the WORKERs table, whose DOB is in between „19-JAN-1984" and 18-JAN-1987".

(iv) To add a new row with the following :

19, „Days Kishore", „Operator", „P003". „19-Jun-2008", „11-Jul-1984"

(v) To display all the details of WORKER table whose name's first letter is 'R'.

REVISION TOUR:-

Q1 a. Define Macro with suitable example. 2

b. Which C++ header file (s) will be included to run /execute the following C++ code?

```
1 void main( )

{int  Last =26.5698742658;

        cout<<setw(5)<<setprecision(9)<<Last;      }
```

c. Rewrite the following program after removing any syntactical errors. Underline each correction made. 2

```
#include<iostream.h

> void main( )

        int A[10];

        A=[3,2,5,4,7,9,10]

        ;

            for( p = 0; p<=6; p++)

                {       if(A[p]%2=0)

                        int S = S+A[p];          }

                cout<<S;        }
```

d. Find the output of the following C++ program: 2

```
#include<iostream.h>

void repch(char s[])
```

```
        {
          for (int i=0;s[i]!='\0';i++)
            {
                if(((i%2)!=0) &&(s[i]!=s[i+1]))
                {
                        s[i]='@';
                    }
                else if (s[i]==s[i+1])
                {
                        s[i+1]='!';
                        i++;
                 }
              }
      }
void main()
 {
   char str[]="SUCCESS";
   cout<<"Original String"<<str
   repch(str);
   cout<<"Changed String"<<str;
 }
```

e. Find the output of the following : 3

```
        #include<iostream.h>
                void switchover(int A[ ],int N, int split)
                        {
```

```
                    for(int K = 0; K<N; K++)
                        if(K<split)
                            A[K] += K;
                        else
                            A[K]*= K;
}

    void display(int A[ ] ,int N)
      {
        for(int K = 0; K<N; K++)
            (K%2== 0) ?cout<<A[K]<<"%" : cout<<A[K]<<endl;
      }
  void main( )
                    { int H[ ] = {30,40,50,20,10,5};
                        switchover(H,6,3);
                        display(H,6);
                    }
```

f. Observe the following C++ code and find out , which out of the given options i) to iv) are the expected correct output.Also assign the maximum and minimum value that can be assigned to the variable 'Go'. 2

```
  void main()
    { int X [4] ={100,75,10,125}; int
    Go = random(2)+2;
      for (inti = Go; i< 4; i++)
```

```
cout<<X[i]<<"$$";

}
```

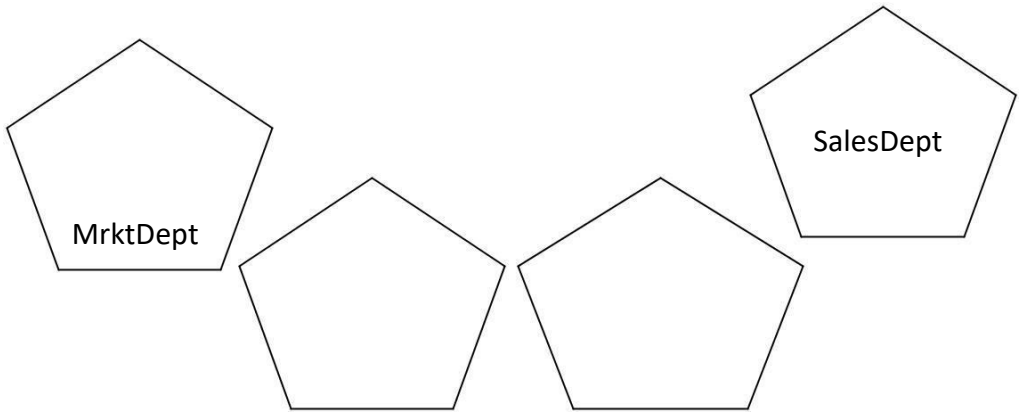
i. 100$$75 ii. 75$$10$$125$$ iii. 75$$10$$ iv.10$$125$

NETWORKING:-

Q 7.a Write any 1 advantage and 1 disadvantage of Bus topology.

b. SunRise Pvt. Ltd. is setting up the network in the Ahmadabad. There are four departments

named as MrktDept, FunDept, LegalDept, SalesDept.



Legal Dept Fun Dept

Distance between various buildings is given as follows:

MrktDept to FunDept	80 m
MrktDept to LegalDept	180m
MrktDept to SalesDept	100 m
LegalDept to SalesDept	150 m
LegalDept to FunDept	100 m
FunDept to SalesDept	50 m

Number of Computers in the buildings:

MrktDept	20
LegalDept	10
FunDept	08
SalesDept	42

i) Suggest a cable layout of connections between the Departments and specify topology.

ii) Suggest the most suitable building to place the server with a suitable reason.

iii) Suggest the placement of i) modem ii) Hub /Switch in the network.

iv) The organization is planning to link its sale counter situated in various part of the same city/ which type of network out of LAN, WAN, MAN will be formed? Justify.

c. Name the protocol

i. Used to transfer voice using packet switched network.

ii.Used for chatting between 2 groups or between 2 individuals.

d. What is an IP Address?

e. What is HTTP?

f. Explain the importance of Cookies.

g. How is 4G different from 3G?