Mock Test Paper-3
Computer Science

Duration : 3hrs   **Max Marks :** 70

1.

   (a) How does a class inforce data hiding?   2

   (b) Name the header files to which the following belong-   1

   (c) Rewrite the following program after removing the syntactical errors. If any.   2

Underline the each correction.

```
#include <iostream.h>
void main()
{
    struct serial
        {
            char serial_name[20];
            char serial_type;
            int cost=200;
        } SERIAL;
    gets(serial_name);
    gets(serial_type);
}
```

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

```
#include<iostream.h>
#include<string.h>
class student
    {
        char *s_name;
        int l;
        public :
            student() { l=0; s_name =new char[l+1];}
            student(char *s)
                { l=strlen(s); s_name=new char[l+1];
                    strcpy(s_name,s);
                }
        void display() { cout<<s_name<<endl;}
        void manipulate( student &a, student &b)
            {
            l=a.l +b.l;
            delete s_name;
            s_name = new char[l+1];
            strcpy(s_name,a.s_name);
            strcpy(s_name,b.s_name);
```

```
            }
        };
    void main()
    {
        char *temp="John";
        student name1(temp), name2("Johny"), name3("Janardan"),s1,s2;
        s1.manipulate(name1,name2);
        s2.manipulate(s1,name3);
        s1.display();
        s2.display();
    }
```

(e) Find the output of the following program-   2

```
    #include<iostream.h>
    void main()
    {
        long number=7583241;
        int First=0, Second=0;
        do
        {
            int R=Number%10;
            if (R%2 = = 0)
                First +=R;
            else
                Second+=R;
            Number/=10;
        }
        while (Number>0);
        cout<<First – Second;
    }
```

(f) In thefollwoing program, find the correct possible output(s) from the options :   2

```
    #include<stdlib.h>
    #include<iostream.h>
    void main()
    {
    randomize();
    char City[][10]={"DEL","CHN","KOL","BOM","BNG"};
    int Fly ;
    for( int I= 0 ;I<3;I++)
        {
            Fly = random(2)+1;
            cout<<City[Fly]<<" :";
        }
    }
```

Outputs :

(i) DEL : CHN : KOL :   (ii) CHN : KOL : CHN :

(iii) KOL : BOM : BNG :(iv) KOL : CHN : KOL :

2.

(a) What is "this" pointer? Give an example to illustrate the use of it in C++.2

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

class exam

```
    {
        int year;
        public :
            exam(int y) { year=y;}    //Constructor 1
            exam(exam &t); //Constructor 2
    };
```

(i) Create an object, such that it invokes constructor 1.   1

(c) Define a class named Hostel in C++ with the following descriptions :   4

Private members-

REG_NO   Integer

NAME   Array of characters (String)

TYPE   Character

COST   Float

 Public members-

                - Function Read_Data() to read an object of Hostel type.

                - Function Display() to display the detail of an object.

(d) Answer the questions (i) to (iii) based on the following codes-

```
        class Furniture
    {
        char Type;
        char Mode[10];
        public :
        furniture();
        void Read_fur_details();
        void Disp_fur_details();
    };
    class Sofa :public Furniture
    {
        int no_of_seats;
        float cost_of_sofa;
        public :
        void Read_sofa_details();
        void Disp_sof_details();
    };
    class Office :private Sofa
```

```
        {
            int no_of_pieces;
            char delivery_date[10];
            public :
            void Read_office_details();
            void Disp_office_details();
        };
        void main()
        {    Office MyFurniture;}
```

(i)   Mention the member names which are accessible by MyFurniture declared in main() function.

(ii)   What is the size of MyFurniture in bytes?

(iii) Mention the names of functions accessible from the member function Read_office_details() of class Office.

(iv) Name the data members accessible from the object of Furniture.

3.

(a) Write a function in C++ which accepts an integer array and its size as arguments/ parameters and assigns the elements into a two dimensional array of integers in the following format- 3

if the array is 1,2,3,4,5,6   if the array is 1,2,3

The resultant 2D array is given below   The resultant 2D is given below

1	0	0	0	0	0
1	2	0	0	0	0
1	2	3	0	0	0
1	2	3	4	0	0
1	2	3	4	5	0
1	2	3	4	5	6

1	0	0
1	2	0
1	2	3

(b) An array X[10][10] is stored in the memory along the row with each element occupying 4 bytes of memory. Find out the base address and the address of element X[8][5], if the location of X[3][7] is stored at the address 1000.   3

(c) Write a function PUSH() to add an element to the top of the Stack dynamically. Consider the following NODE for stack-   4

```
struct NODE
{
    int RollNum;
    char Name[20];
    NODE *Link;
};
```

(d) Write a function MatConvert() in C++ to convert the odd numbers even by multiplying the elements by 2 and convert all even numbers by dividing the elements by 2 of Arr[M][N].   2

(e) Solve the following postfix expression -   2

10,3,*,7,1,-,*,23,+

4.

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

```
class Book
{
    int Book_No;
    char Book_Name[20];
    public :
        //function to enter book detail
        void enterdetails();
        //function to display Book details
        void showdetails();
        //function to return Book_no
        int Rbook_no() { return Book_no;}
};
void Modify(Book NEW)
{
    fstream File;
    File.open("Book.Dat",ios : :binary|ios : :in|ios : :out);
    Book OB;
    int Recordsread = 0, Found = 0;
    while (!Found && File.read((char *)&&OB, sizeof(OB)))
    {
        Recordsread++;
        if ( NEW.RBook_no() = = OB.RBook_no())
        {
            _____ //Missing statement
            File.write((char*)&&NEW, sizeof(NEW));
            Found=1;
        }
        else
        File.write((char *)&OB, sizeof(OB));
    }
    if (!Found)
        cout<<"Record for modification does not exist";
    File.close();
}
```

If the function Modify is supposed to modify a record in file BOOK.DAT with the values of Book NEW passed to its argument, write the appropriate statement for Missing Statement using seekg(0 or seekg(), whichever needed, in the above code that would write the modified record at its proper place.

(b) Write a function to count the number of alphabets present in a text file named "TEXT.TXT".   2

(c) Following is the structure of each record in a data file named "ITEMS.DAT".

```
struct ITEM
{
```

```
        char Item_code[10];
        char Item_Description[10];
        int Stock;
    };
```

Write a function in C++ to update the file with a new value of stock. The Stock and the Product_code whose stock is to be updated, are reading during the execution of the program.   3

```
void modify()
    {
        fstream out;
        out.open("ITEMS.DAT",ios : :binary|iost : :in|ios : :out)
        ITEM P1;
        int flag=0;stock; char Icode[10];
    gets(Icode);
    cin>>stock;
        while (out.read((char *)&P1, sizeof(P1)))
            if (strcmp(P1.Item_code,Icode)= =0)
            {
            flag=1;
            P1.Stock=stock;
            int Position =out.tellg()-sizeof(P1);
            out.seekp(Position);
            out.write((char *)&P1, sizeof(P1));
            }
        if (!flag) cout<<"Product code does not match"<<endl;
        out.close();
    }
```

5.

(a) What are DDL and DML?   2

(b) Study the following tables FLIGHTS and FARES and answer the questions given in b1 and b2.

TABLE : FLIGHTS

FL_NO	STARTING	ENDING	NO_FLIGHTS	NO_STOPS
IC301	MUMBAI	DELHI	8	0
IC799	BANGLORE	DELHI	2	1
MC101	INDORE	MUMBAI	3	0
IC302	DELHI	MUMBAI	8	0
AM812	KANPUR	BANGLORE	3	1
IC899	MUMBAI	KOCHI	1	4
AM501	DELHI	TRIVENDRUM	1	5
MU499	MUMBAI	MADRAS	3	3
IC701	DELHI	AHMEDABAD	4	0

TABLE : FARES

FL_NO	AIRLINES	FARE	TAX%
IC701	Indian Airlines	6500	10
MU499	Sahara	9400	5
AM501	Jet Airways	13450	8
IC899	Indian Airlines	8300	4
IC302	Indian Airlines	4300	10
IC799	Indian Airlines	10500	10
MC101	Deccan Airlines	3500	4

(b1) Write the SQL commands for the following statements-   4

(i)   Display FL_NO and NO_FLIGHTS from "KANPUR" to "BANGLORE" from the table FLIGHTS.

(ii) Arrange the contents of the table FLIGHTS in the ascending order of FL_NO.

(iii) Display the FL_NO and fare to be paid for the flights from DELHI to MUMBAI using the tables FLIGHTS and FARES, where the fare to be paid = FARE +FARE * TAX%100.

(iv) Display the minimum fare "Indian Airlines" is offering from the table FARES.

(b2) Write the output of the following SQL statements-   2

(i)   SELECT FL_NO, NO_FLIGHTS, AIRLINES from FLIGHTS, FARES where STARTING="DELHI" and FLIGHTS.FL_NO=FARES.FL_NO;

(ii) SELECT COUNT(DISTINCT ENDING) from FLIGHTS;

(iii) SELECT ENDIING,COUNT(ENDING) FROM FLIGHTS GROUP BY ENDING;

6.

(a) State and verify Associative Law.   2

(b) Write the equivalent expression for following logical circuit-   2
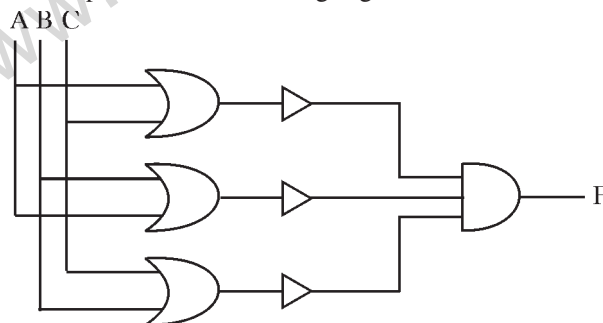
(c) Express P+Q'R in POS form-   1

(d) Reduce the following Boolean expression using K-Map-   3
    F(P,Q,R,S)=?(0,3,5,6,7,11,12,15)

7. (a) Name two transmission media for networking.   1

(b) Expand the following terms-   1
    (i) GSM
    (ii) CDMA

(c) Differentiate between Hackers and Crackers.   1

(d) What is meant by FTP? 1

(e) Indira Convent School in Lucknow is setting up the network between its different wings. There are 4 wings named as Senior(S), Junior(J), Admin(A) and Hostel(H).

Distance between various wings is given below-

Wing A to Wing S   100m

Wing A to Wing J   200m

Wing A to Wing H   400m

Wing S to Wing J   300m

Wing S to Wing H   100m

Wing J to Wing H   450m

Number of Computers

Wing A 10

Wing S 200

Wing J 100

Wing H 50

(e1) Suggest a suitable topology for networking the computer of all wings. 1

(e2) Name the wing where the server is to be installed. Justify your answer. 1

(e3) Suggest the placement of Hub/Switch in the network. 1

(e4) Mention the economic technology to provide Internet accessibility to all the wings. 1

Note : Satellite Link, Optical Fiber, Microwave and leased line are not acceptable solution for this question.

(f1) What is a shareware? 1

(f2) Explain hacking. 1