Q.1) (a) Differentiate between call by value and call by reference, giving suitable example of each   (2)

(b) Name the header file to which the following belong: (1)

   (i) abs( )   (ii) random( )   (iii) isalnum( )   (iv) exp( )

(c) What is the purpose of using a typedef command in c++. Explain with suitable example.   (1)

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

```
#include<conio.h>
void main( );
{ structure movie
   {   char movie_name[25];
       char movie_type;
       int ticket_cost=50;
   }M
   gets(movie_name);
   gets(movie_type);
}
```

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

```
#include<iostream.h>
void Withdef(int HisNum=29)
{ for(int I=12;I<=HisNum;I+=7)
        cout<<I<<",";
   cout<<endl;
}
void Control(int &MyNum)
{ MyNum+=8;
   Withdef(MyNum);
}
void main( )
{  int YourNum=16;
   Control(YourNum);
   Withdef( );
   cout<<"Number="<<YourNum<<endl;
}
```

(f) Observe the following program TEST.CPP carefully, if the value of Disp entered by the user is 22, choose the correct possible output(s) from the options from (i) to (iv), and justify your option.   (2)

```
#include<stdlib.h>
#include<iostream.h>
void main( )
{ randomize( );
   int Disp,Rnd;
   Cin>>Disp;
   Rnd=random(Disp)+15;
   for(int N=1,i=3;i<=Rnd; i+=4,N++)
        cout<<N<<" ";   }
```

Output Options: (i) 1   (ii) 1 2   3 4   (iii) 1   2   (iv) 1   2   3

(g) Find the output of the following program: (2)

```
#include<iostream.h>
#include<string.h>
class State
{  char *state_name;
    int size;
  public:
     State( ){size=0;state_name=new char [size+1];}
     State(char *s)
     { size=strlen(s);
```

```cpp
        state_name=new char[size+1];
         strcpy(state_name,s);
       }
       void display( )
       { cout<<state_name<<endl;
       }
        void Replace(state &a, state &b)
       { size=a.size+b.size;
         delete state_name;
         state_name=new char[size+1];
         strcpy(state_name, a.state_name);
         strcat(state_name, b.state_name);
       }
};
void main( )
{   char *temp="Calcutta";
    State state1(temp),state2("Hyderabad"),state3("Chennai"),S1,S2;
    S1.Replace(state1,state2);
    S2.Replace(S1,State3);
    S1.display( );
    S2.display ( );
    S2.Replace(state2,state3);
    S2.display( );
}
```

Q2) (a) Explain about virtual base class using a suitable example.   (2)

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

```cpp
    class Date
    {   int day,month,year;
     public:
        Date(Date &D);                        //Constructor 1
        Date(int a,int b,int c)               //Constructor 2
        {   day=a;
            month=b;
            year = c;
        }
    };
```

   (i)   Write complete definition for Constructor 1

   (ii)   Create an object, such that it invokes Constructor 2

(c) Define a class PhoneBill in C++ with the following descriptions.   (4)

   Private members:

    CustomerName   of type character array

    PhoneNumber   of type long

    No_of_units   of type int

    Rent   of type int

    Amount   of type float.

    calculate( )   This member function should calculate the value of amount as Rent+ cost for the units.

Where cost for the units can be calculated according to the following conditions.

No_of_units	Cost
First 50 calls	Free
Next 100 calls	0.80 @ unit
Next 200 calls	1.00 @ unit
Remaining calls	1.20 @ unit

   Public members:

 * A constructor to assign initial values of CustomerName as "Raju", PhoneNumber as 259461, No_of_units as 50, Rent as 100, Amount as 100.

    * A function accept( ) which allows user to enter CustomerName, PhoneNumber,No_of_units and Rent and should call function calculate( ).

* A function Display( ) to display the values of all the data members on the screen.

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

```
class Teacher
  {    char TNo[7],TName[25],Dept[12];
       int Wload;
    protected:
       double Sal;
       void AssignSal(double);
    public:
       Teacher( );
       Teacher(Double S);
       void TeaNew( );
       void TeaDisplay( );
  };
class Student
  {    char ANo[6],SName[15],Group[7];
    protected:
       int Att,Total;
    public:
       Student( );
       void StuAccept( );
       void StuDisplay( );
  };
class School: public Student, private Teacher
  {    char SchCode[9],SchName[15];
    public:
       School( );
       void SchAccept( );
       void SchDisplay( );
  };
```

(i) How many bytes will be reserved for an object of type School?

(ii) Name the members that can be called by object of type School.

(iii)Which type of inheritance is depicted by the above example?

(iv) Identify the member function(s) that cannot be called directly from the objects of class School
   from the following: (a) TeaNew( ) (b) StuAccept( ) (c) SchDisplay( ) (d)AssignSal( )

Q3) (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 Arr[35][15] is stored in the memory along the row with each of its element occupying 4 bytes. Find out the base address and the address of an element Arr[20][5], if the location Arr[2][2] is stored at the address 3000. (4)

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

If the array is 1 2 3 4 5   If the array is 10 15 20
The output must be   The output must be
 1 0 0 0 5   10   0   20
 0 2 0 4 0   0   15   0
 0 0 3 0 0   10   0   20
 0 2 0 4 0
 1 0 0 0 5

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

(e) Evaluate the following postfix notation of expression (show the position of stack) (2)
   25   11   2   %   *   5   -

Q4) (a) Observe the program segment given below carefully , and answer the question that follows (1)

```
class Member
  {    int Member_no ;
```

```cpp
        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)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 start with a lowercase vowel (i.e. with 'a', 'e', 'I', 'o', 'u').   (3)

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

(c)Given a binary file STUDENT.DAT contains the records of the following structure type: (2)
```cpp
    struct Student
    {  int rno;
       float m1,m2,m3;
    };
```
Write a function in C++ that would read contents from the file STUDENT.DAT and modify the marks to 35 if anybody's any marks are less than 35.

Q.5) (a) Differentiate between DDL and DML. Mention the 2 commands for each caterogy.   (2)

(b) Write the SQL commands for (i) to (iv) and outputs for (v) to (viii) on the basis of tables
   BOOKS and ISSUES.(4 X 1 + 4 X 0.5)   (6)

Table: BOOKS

Book_ID	BookName	AuthorName	Publisher	Price	Qty
L01	Maths	Raman	ABC	70	20
L02	Science	Agarkar	DEF	90	15
L03	Social	Suresh	XYZ	85	30
L04	Computer	Sumita	ABC	75	7
L05	Telugu	Nannayya	DEF	60	25
L06	English	Wordsworth	DEF	55	12

Table: ISSUES

Book_ID	Qty_Issued
L02	13

L04	5
L05	21

(i) To show Book name, Author name and Price of books of ABC publisher.

(ii) To display the details of the books in descending order of their price.

(iii) To decrease the Qty_Issued from ISSUES table by 3 (all rows must decrease).

(iv) To display the Book Id, Book name, Publisher, Price, Qty, Qty_Issued from both the tables with their matching Book ID.

(v) SELECT sum(price) FROM Books WHERE Publisher = "DEF";

(vi)SELECT Publisher, min(price) FROM Books GROUP BY Publisher;

(vii)SELECT Price from Books, Issues where Books.Book_ID=Issues.Book_ID AND Qty_Issued=5;
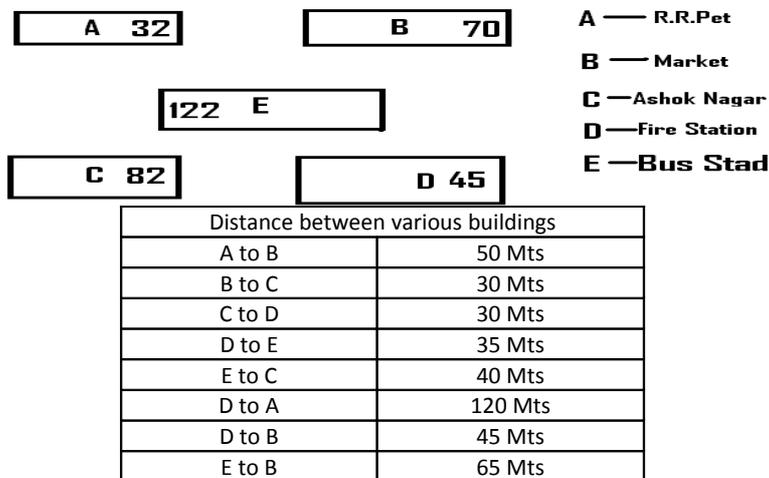
(viii)SELECT Count(Distinct Publisher) FROM Books;

Q6) (a) State and prove Demorgan's laws. (2)

(b) Write the equivalent Boolean expression for the following logic circuit. (1)
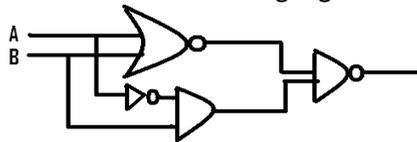
(c) Express the F(X,Z)=X+X'Z into canonical SOP form. (1)

(d) Write the equivalent canonical POS expression for the following SOP expression:

F(x,y,z)=Σ(0,2,5,6). (1)

(e) Reduce the following Boolean expression using the K-map. (3)

F(A,B,C,D)= Σ(0,1,3,4,7,8,11,12,15);

Q.7) (a) Expand the following terms: (i) GSM (ii)TCP/IP (1)

(b) What is the difference between XML and HTML? Write two differences. (1)

(c) What is a topology? Write short note on Bus topology. (2)

(d) In Hyderabad, 5 ABC Bank branches are available. One is at RR Pet, other at Market, other at Ashok Nagar, other at Fire Station and the last one at Bus Stand. Higher official want to keep a network between these 5 branches. The branch names(A to E) and the number of computers in each branch(given inside the rectangle) is given below.

A ——— R.R.Pet
B ——— Market
C —Ashok Nagar
D —Fire Station
E —Bus Stad

Distance between various buildings	
A to B	50 Mts
B to C	30 Mts
C to D	30 Mts
D to E	35 Mts
E to C	40 Mts
D to A	120 Mts
D to B	45 Mts
E to B	65 Mts

(i) Suggest a possible cable layout for connecting the buildings. (1)

(ii)Suggest the most suitable place to install the server of this organization with a suitable reason (1)

(iii) Suggest the placement of the following devices with justification. (1)

   (a) Hub/Switch (b) Modem

(iv) The Bank wans to link its head Office in 'A' building to its main office at Mumbai. (1)

   (a) Which type of transmission medium is appropriate for such a link?

   (b) What type of network this connection result into?

ALL THE BEST

"EVERY LITTLE EFFORT HAS ITS FRUIT"

Ie WHAT EVER EFFORT YOU SHOW TOWARDS EXAM PREPARTION, THAT WILL BE USEFUL.