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HOTS FOR BRIGHT STUDENTS

COMPUTER SCIENCE

CLASS – XII

CHAPTER – 1 (REVISION OF C++)

1) Find the output of the following program;

```
#include<iostream.h>
#include<ctype.h>
void main( )
{ char Text[ ] = "Mind@work!";
for(int I=0; Text[I]!='\0';I++)
{ if(!isalpha(Text[I]))
Text[I]="*";
else if(isupper(Text[I]))
Text[I]=Text[I]+1;
else
Text[I] = Text[I+1]; }
cout<<Text; }
```

Ans: Output: **Nnd@*Xrk!***

2) Find the output of the following program:

```
#include<iostream.h>
#include<ctype.h>
void main( )
{       char Mystring[ ] = "what@OUTPUT!";
        for(int I=0; Mystring[I]!='\0';I++)
        { if(!isalpha(Mystring[I]))
        Mystring[I]='*';
        else if(isupper(Mystring[I]))
                Mystring[I]=Mystring[I]+1;
        else
                Mystring[I] =Mystring[I+1];
        } cout<<Mystring; }
```

Ans: Output: **hat@*PVUQVU***

3) Find the output of the following program.

```
#include<iostream.h>
void Withdef(int HisNum=30)
{       for(int I=20;I<=HisNum;I+=5)
        cout<<I<<",";
        cout<<endl;    }
void Control(int &MyNum)
{       MyNum+=10;
        Withdef(MyNum);     }
void main()
{       int YourNum=20;
        Control(YourNum);
        Withdef();
        cout<<.Number=.<<YourNum<<endl;         }
```

Ans: Output:
20,25,30,

20,25,30,
Number=30

4) Find the output of the following program:

```
#include<iostream.h>
void Indirect(int Temp=20)
{       for(int I=10;I<=Temp;I+=5)
        cout<<I<<",";
        cout<<endl;    }
void Direct(int &Num)
{       Num+=10;
        Indirect(Num);          }
void main( )
{       int Number=20;
        Direct(Number);
        Indirect( );
        cout<<"Number ="<<Number<<endl;                 }
```

Ans: Output:
10,15,20,25,30,
10,15,20,
Number =30

5) Find the output of the following program:

```
#include<iostream.h>
#include<ctype.h>
void Secret(char Msg[],int N);
void main( )
{       char SMS=" rEPorTmE";
        Secret(SMS,2);
        cout<<SMS<<endl;    }
void Secret(char Msg[],int N)
{       for(int c=10;Msg[]1='\0';c++)
        if(c%2==0)
                Msg[c]= Msg[c]+N;
        else if (isupper(Msg[c]))
        Msg[c]=tolower(Msg[c]);
        else
        Msg[c]= Msg[c]-N;    }
```

Ans: Output: teRmttoe

6) Find the output of the following program:

```
#include<iostream.h>
struct three_d
{       int x,y,z;        };
        void movein(three_d &t, int step=1)
        {       t.x+=step;
                t.y+=step;
                t.z+=step;       }
        void moveout(three_d &t, int step=1)
        {       t.x-=step;
```

```
        t.y+=step;
        t.z-=step;      }
void main()
{       three_d t1={10,20,5},t2={30,10,40};
        movein(t1);
        moveout(t2,5);
        cout<<t1.x<<","<<t1.y<<","<<t1.z<<endl;
        cout<<t2.x<<","<<t2.y<<","<<t2.z<<endl;
        movein(t2,10);
        cout<<t2.x<<","<<t2.y<<","<<t2.z<<endl;  }
```

Ans: Output:

11, 21 ,6
25 , 15, 35
35, 25, 45

7) Write the output of the following program:

```
#include<iostream.h>
int func(int &x,int y=10)
{ if(x%y==0) return ++x;else return y- -; }
void main( )
{       int p=20,q=23;
        q=func(p,q);
        cout<<p<<q<<endl;
        p=func(q);
        cout<<p<<q<<endl;
        q=func(p);
        cout<<p<<q<<endl;           }
```

Ans: Output:

2023
1023
1111

8) Find the output of the following program.

```
#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]=='A'||Msg[cnt]=='a')
                                        Msg[cnt]=ch;
                                else
                        if(cnt%2==0)
                                Msg[cnt]=toupper(Msg[cnt]);
                        else
                                Msg[cnt]=Msg[cnt-1];
                        }       }
```

```
void main()
{       char MyText[]="ApEACeDriVE";
        Mycode(MyText,'@');
        cout<<"NEW TEXT: "<<MyText<<" "<<endl;
}
```

8)Ans: Output:
New Text=@@@@ccddIIe

CHAPTER – 2 (OBJECT ORIENTED LANGUAGE)

Q1. Explain Function?
Ans: Name given to group of statements that does some specific task and may return a value. Function can be invoked(called)any no. of time and anywhere in the program.

Q2. Explain Function prototypes?
Ans: Function declaration that specifies the function name, return type and parameter list of the function.

syntax: return_type function_name(type var1,type var2,....,type varn);

Q3. Explain Actual and Formal Parameters?
Ans: Variables associated with function name during function call statement. Formal ParametersVariables which contains copy of actual parameters inside the function definition.

Q4.What are Local variables?
Ans:Declared inside the function only and its scope and lifetimeis function only and hence accessible only inside function.

Q5. What are Global variables?
Ans:Declared outside the function and its scope and lifetime is whole program and hence accessible to all function in the program from point declaration.
Example :

```
#include <iostream.h>
int a=20;
// global
void main()
{
int b=10;
// local
cout<<a<<b;
}
```

Q6. What is Passing by value?
Ans:In this method separate memory created for formal arguments and if any changes done on formal variables , it will not affect the actual variables. So actual variables are preserved in this case

Q7. What is Passing by address/reference?

Ans:Passing by address/reference: In this method no separate memory created for formal variables i.e formal variables share the same location of actual variables and hence any change on formal variables automatically reflected back to actual variables.

Example :

```
void sample( int a, int &b)
{
a=a+100;
b=b+200;
cout<<a<<b;
}
void main()
{
int a=50, b=40;
cout<<a<<b; // output 50 40
sample(a,b) // output 150 240
cout<<a<<b; // output 50 240
}
```

Q8. What is Function overloading?

Ans. Processing of two or more functions having same name but different list of parameters

Function overloading in C++

A function name having several definitions that are differentiable by the number or types of their arguments is known as function overloading.

Example : A same function print() is being used to print different data types:

```
#include <iostream.h>
class printData
{
public:
void print(int i) {
cout << "Printing int: " << i << endl;
}
void print(double f) {
cout << "Printing float: " << f << endl;
}
void print(char* c) {
cout << "Printing character: " << c << endl;
}
};

int main(void)
{
printData pd;// Call print to print integer
pd.print(5);// Call print to print float
pd.print(500.263);// Call print to print character
pd.print("Hello C++");
return 0;
}
```

When the above code is compiled and executed, it produces following result:
Printing int: 5
Printing float: 500.263
Printing character: Hello C++

Q10 What is Function recursion?
Ans:Function that call itself either directly or indirectly.

Q11. What is Structure?-
Ans:Collection of logically related different data types (Primitive and Derived) referenced under one name.

e.g.
struct employee
{
int empno;
char name[30];
char design[20];
char department[20];
}
Declaration:
employee e;
Input /Output : cin>>e.empno; // members are accessed using dot(.) operator.
cout<<e.
empno;

Q12. What is a Nested structure?
Ans:A Structure definition within another structure.

A structure containing object of another structure.
e.g.
struct address
{
int houseno;char city[20];char area[20];long int pincode;};

struct employee
{
int empno;
char name[30];char design[20];char department[20];
address ad; //nested structure
}

Declaration:
employee e;

CHAPTER – 3 (CONSTRUCTOR & DESTRUCTOR)

Q1:- What is copy constructor? What do you understand by constructor overloading?

Ans: - A copy constructor is a constructor that defines and initializes an object with another object of same class.

Syntax- class name object 1;

class name object2 (object1); // copy constructor.

Constructor overloading refer to a class having multiple constructor definition each having different signature.

Q2:- Why is a destructor function required in a class? Illustrate with the help of example.

Ans:- During the constructor of an object by the constructor,resources are allocated for use. For example allocation of memory,opening of file etc.These allocated resources must be deallocated before the object is destroyed. A destructor is responsible for this task and perform all clean up jobs like closing a file, deallocating and releasing area automatically.

Q3:-Find the syntax error(s), if any (giving reason for error) in following-

```
Class ABC
{ int x=10; float y;
ABC()
{ y=5; } ~() {  } }
void main( )
 { ABC a1,a2; }
```

Ans:-

Erroneous Statements	Error and correction
1. int x=10;	Data members can not be initialized with in a class. Hence int x;
2. ~() { }	Name of destructor missing.Hence ~ABC(){ }
3. }	Class definition should end with a semicolon. Hence };

Q4:- How many times is copy constructor called in following-

```
Sample func(Sample u)
{ Sample v(u); Sample w=v; return w; }
 int main() { Sample x; Sample y= func(x); Sample z= func(y); return 0; }
```

Ans:- The copy constructor is called 8 times in this code.Each call to function func() requires to call copy constructor.

Q5 :-What will be order of constructor invocation for the following code-

```
class Date{  ;   };
class Time {   ;  };
class Train { int train( ); Date dep_date; Time dep_time;   };
int main( )  { Date D1; Time T1; Train TR1;  }
```

Ans:- The order of constructor invocation will as follows-

1. Date:: Date() constructor for D1 object.
2. Time::Time() constructor for T1 object.
3. Date:: Date() for dep_date(of TR1) object
4. Time::Time() constructor fordep_time(ofTR1) object.
5. Train:: Train() for TR1 object.

Q6:-Find the output of following-

```
#include<iostream.h>
Class METRO
{   intMno,TripNo,PassengerCount;
   Public:  METRO(int Tmno=1)
                 { Mno= Tmno;  TripNo =0; PassengerCount=0; }
              Void  Trip(int PC=20)
```

```
        { TripNo++; PassengerCount +=PC;   }
      Void StatusShow()
        {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();      }
```

Ans:- Output- 5:1:20
1:1:50
5:2:5

Q7:- Answer the questions (i) and (ii) after going through the following class-

```
Class Book
  { int BookNo; char BookTitle[20];
   Public:   Book();                          //function 1
             Book(Book &);                    //function 2
               Book(int, char[])      ;       //function 3
               void Buy();                    //function 4
                void Sell();                  //function 5   };
void main()
   {    ; ;   }
```

(i) Write statements in c++ to execute function3 and function 4 inside the main() function

(ii) Name the feature of object oriented programming,which is illustrated by function1, function2 and function 3 combined together.

Ans:- (i) Book B(10,"GABS");
(ii) Constructor Overloading.

Q.8 Answer the questions (i) and (ii) after going through the following class:

```
class Interview
{ char Post[20];
 int No_Of_Candidates;
public:
 Interview()                  //Function 1
 {
strcpy(Post, "Fresher");
 No_of_Candidates = 0;
 }
 Interview(char *p, int n)          //Function 2
 {
strcpy(Post, p);
No_Of_Candidates = n;
}
 Interview(Interview & I);          //Function 3
 ~Interview()                 //Function 4
{
cout<<" Interview Over" ;
 }};
```

(i) Which concept of OOP is illustrated by Function 1 and Function 2 together? Write an example illustrating the calls for these functions.

(ii) Write complete definition for Function 3.

Ans-

(i) It illustrates the concept of Polymorphism through constructor overloading.

```
Interview obj;
Interview obj1("Trainee", 20);
```

(½ mark for mentioning constructor overloading and ½ mark for remaining answer)

(ii)
```
Interview(Interview & I)
        { strcpy(Post, I.Post);
    No_Of_Candidates = I. No_Of_Candidates;
                }
```

Q9. Answer the following questions after going through the following class:

```
class Seminar{
        int Time;
public:
        Seminar();                                          //Function 1
        void Lecture()                                      //Function 2
        {cout<<"Lectures in the seminar on"<<end1;}
        Seminar(int);                                       //Function 3
        Seminar(Seminar &abc);                              //Function 4
        ~Seminar()                                          //Function 5
        {  cout<<"Vote of thanks"<<end1;}};
```

(i) In Object Oriented Programming, what is Function 5 referred as and when does it get invoked/called?

Ans : Function 5 is referred as destructor and it is invoked as soon as the scope of the object gets over.

(ii) In Object Oriented Programming, which concept is illustrated by Function 1, Function 3 and Function 4 all together?

Ans : Constructor Overloading (Polymorphism)

(iii) Which category of constructor - Function 1 belongs to? Write an example illustrating the calls for Function 1.

Ans : Default Constructor. Example to invoke function 1 → Seminar S;

(iv) Which category of constructor - Function 3 belongs to? Write an example illustrating the calls for Function 3.

Ans : Parameterised Constructor. Example to invoke function 3 → Seminar A(8);

(v) Which category of constructor - Function 4 belongs to? Write an example illustrating the calls for Function 4.

Ans : Copy Constructor. Example to invoke function 4 → Seminar S2(S);
Or Seminar S2 = S;

(vi) Write an example illustrating the calls for Function 3 explicitly.

Ans : Seminar A = Seminar(8);

Q10. Answer the following questions after going through the following class:

```
class Complex{
        int x;
        int y;
public:
        Complex();                                          //Function 1
```

```
void disp()                                          //Function 2
{cout<<"The Complex number is : "<<x<<" + "<<y<<"i"<<end1;}
Complex(int, int);                                   //Function 3
Complex(Complex &abc);                               //Function 4 };
```

(i) Which category of constructor - Function 1 belongs to? Write an example illustrating the calls for Function 1.

Ans : Default Constructor. Example to invoke function 1 → Complex C;

(ii) Which category of constructor - Function 3 belongs to? Write an example illustrating the calls for Function 3.

Ans: Parameterised Constructor. Example to invoke function 3→Complex C(6,8);

(iii) Which category of constructor - Function 4 belongs to? Write an example illustrating the calls for Function 4.

Ans : Copy Constructor. Example to invoke function 4 → Complex C2(C);
Or Complex C2 = C;

(iv) Write an example illustrating the calls for Function 3 explicitly.

Ans : Complex C = Complex(6,8);

(v) Write an example illustrating the calls for Function 4 explicitly.

Ans : Complex C2 = Complex(C);

(vi) Write the complete definition for Function 1 to initialize x as 10 and y as 20.

Ans : Complex :: Complex ()
{ x = 10 ; y = 20; }

CHAPTER – 4 (INHERITANCE – EXTENDED CLASS)

1. How does the visibility modes control the access of members in the derived class? Give example.

If a base class and a derived class each include a member function with the same name and arguments, which member function will be called by the object of the derived class if the scope operator is not used?
Answer: Function of the derived class.

2. Consider the following code:

```
class livingbeing
{
        char specification[20];
        public:
                void read();
                void show();
};
class human: livingbeing
{};
```

What is the access level for the member function "read()" in the class "human"?

Answer: Private

3. What is code reusability? How can we achieve it and what is its advantage?

Answer: Code reusability means once a code is written, it can be reused in other parts of the program in which new classes are created from existing classes by inheriting their attributed and behaviors and overriding or embellishing these with capabilities the new classes require.

The advantage is that, when creating a new class, instead of writing completely new data members and member functions, the programmer can designate that the new class is to inherit the data members and member functions of a previously defined base class.

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

```
class Employee
{
        int id;
        protected:
                char name[20];
                char doj[20];
        public:
                Employee();
                ~Employee();
                void get();
                void show();
};
class Daily_wager: protected Employee
{
        int wphour;
        protected: int nofhworked;
        public:
                void getd();
                void showd();
};
class Payment: private Daily_wager
{
        char date[10];
        protected:
                int amount;
        public:
                Payment();
                ~Payment();
                void show();
};
```

(i) Name the type of Inheritance depicted in the above code.

(ii) Name the member functions accessible through the object of class Payment.

(iii) From the following, identify the member function(s) that can be called directly from the object of class Daily_wager class
show()
getd()
get()

(iv) Name the base and derived class of Daily_wager class.

Answers:

(i) Multilevel Inheritance

(ii) Show()

(iii) Getd()

(iv) Base Class: Employee, Derived Class: Payment

5. Answer the questions (i) to (iv) based on the following code:

```
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_sofa;
        public:
                void Read_sofa_details();
                void Disp_sofa_details();
};
class office: public sofa
{
        int no_of_pieces;
        char delivery_date[10];
        public:
                void Read_office_details();
                void Didp_office_details();
};
void main()
{
        office MyFurniture;
}
```

(i) Mention the member names which 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) Which type of Inheritance is depicted in the above code?

Answer:
(i) Data Members:
No data member can be called from Myfurniture object.
Member Functions:
Read_fur_details(), Disp_fur_details(), Read_sofa_details(), Disp_sofa_details(), Read_office_details(), Didp_office_details()
(ii) 29 bytes
(iii) Read_fur_details( ), Disp_fur_details( ), Read_sofa_details( ), Disp_sofa_details( ), Disp_office_details( )
(iv) Multilevel Inheritance

6. Answer the questions (i) to (iv) based on the following code:

```
class Medicine
{
        char Category[10];
        char Date_of_manufacture[10];
        char Company[20];
        public:
                Medicine();
                void entermedicinedetails();
                void showmedicinedetails();
};
class capsule: public Medicine
{
        protected:
                char capsule_name[30];
                char volume_lable[20];
        public:
                float Price;
                capsules();
                void entercapsuledetails();
                void showcapsuledetails();
};
class Antibiotics: public Capsule
{
        int Dosage_units;
        char side_effects[20];
        int Use_within_days;
        public:
                Antibiotics();
                void enterdetails();
                void showdetails();
};
```

(i) How many bytes will be required by an object of class Medicines and an object of class Antibiotics respectively?

(ii) Write the names of all the member functions accessible from the object of class Antibiotics.

(iii) Write the names of all the members accessible from member functions of class capsules.

(iv) Write names of all the data members which are accessible from objects of class antibiotics.

Answers:

(i) Medicine – 40 Bytes
Antibiotics Object – 118 Bytes

(ii) entermedicinedetails(), showmedicinedetails(), entercapsuledetails(), showcapsuledetails(), enterdetails(), showdetails()

(iii)
Data Members:
capsule_name[30], volume_lable[20], Price
Member Funcitons:

entermedicinedetails(), showmedicinedetails(), entercapsuledetails(), showcapsuledetails()
(iv) Price

7. Answer the questions (i) to (iv) based on the following code:

```
class University
{       char name [20];
        protected :
                char vc[20];
        public :
                void estd();
                void inputdata();
                void outputdata();
}
class College : protected University
{       int regno;
        protected
                char principal()
        public :
                int no_of_students;
                void readdata();
                void dispdata();
};
class Department : public College
{       char name[20];
        char HOD[20];
        public :
                void fetchdata(int);
                void displaydata( );
};
```

(i) Name the base class and derived class of college.
(ii) Name the data member(s) that can be accessed from function displaydata()
(iii) What type of inheritance is depicted in the above class definition?
(iv) What will be the size of an object (in bytes) of class Department?

Answers:
(i) Base class: University
Derived class: Department
(ii) name[20], HOD[20], principal(), no_of_students, vc[20]
(iii) Multilevel Inheritance
(iv) 85 bytes

8. Answer the questions (i) to (iv) based on the following code:

```
class Exterior
{
        int OrderId;
        char Address[20];
        protected:
                float Advance;
        public:
```

```
        Exterior();
        void Book();
        void View();
};
class Paint: public Exterior
{
    int WallArea,ColorCode;
    protected:
        char Type;
    public:
        Paint() ;
        void PBook();
        void PView();
};
class Bill:public Paint
{
    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 Paint.

(iii) Write the names of all the member functions, 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?

Answers:

(i) Multi Level Inheritance

(ii) WallArea, ColorCode,Type, Advance

(iii) Billing(), Print(), PBook(), PView(), Book(), View()

(iv) Exterior(), Paint(), Bill()

9. Answer the questions (i) to (iv) based on the following code:

```
class Student
{
    int Rno;
    char Name[20];
    float Marks;
    protected:
        void result( );
    public:
        Student ( );
        void Register ( );
        void Display( );
```

```
};
class Faculty
{
        long FCode;
        char FName [20];
        protected:
                float Pay;
        public:
                Faculty ( );
                void Enter( );
                void Show( );
};
class Course: public Student, private Faculty
{
        long CCode [10];
        char CourseName [50];
        char StartDate [8], EndDate [8];
        public:
                Course( );
                void Commence ( );
                void CDetail ( );
};
```

(i) Which type of inheritance is illustrated in the above C++ code?

(ii) Write the names of all the data members, which is /are accessible from member function Commence of class Course.

(iii) Write the names of member functions, which are accessible from objects of class Course.

(iv) Write the names of all the members, which are accessible from objects of class faculty.

Answers:

(i) Multiple Inheritance

(ii) CCode, CourseName, StartDate, EndDate, Pay

(iii) Commence( ), CDetail( ), Register( ), Display( )

(iv) Enter( ), Show( )

CHAPTER – 5 (DATA FILE HANDLING)

1. **Observe the program segment given below carefully, and answer the question that follows:**

```
class Book
{ int Book_no;
char Book_name[20];
public:
//function to enter Book details
void enterdetails();
//function to display Book details
void showdetails();
//function to return Book_no
it 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_OB())
{ _____ //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 fileBOOK.DAT with the values of Book NEW passed to its argument, write the appropriate statement for Missing Statement using seekp() or seekg(), whichever needed, in the above code that would write the modified record at its proper place.

Ans. File.seekg(-1*sizeof(NEW),ios::cur);

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

```
#include<fstream.h>
class Customer
{
long Cno;
char Name[20],Mobile[12];
public:
//function to allow user to enter the Cno, Name, Mobile
void Enter();
//function to allow user to enter (modify) mobile number
void Modify();
//function to return value of Cno
long GetCno() { return Cno;}
};
void ChangeMobile()
{
Customer C;
fstream F;
F.open("CONTACT.DAT",ios::binary|ios::in|ios::out);
long Cnoc; //customer no. whose mobile number needs to be changed
cin>>Cnoc;
```

```
while(F.read((char*)&C,sizeof(c)))
{
If(Cnoc==C.GetCno())
{
C.Modify();
//statement 1
Int Pos= _____ //to find the current position
//of file pointer
// statement 2
_____ //to move the file pointer to write the
//modified the record back on to the file
//for the desired Cnoc
F.write((char*)&C,sizeof(c));
}
}
File.close();
}
```

Ans. Statement 1:
F.tellg() ;
Statement 2:
F.seekp(Pos-sizeof(C));
OR
F.seekp(-l*sizeof(C) ,ios::cur);

3. **Discuss the two methods of opening a file within a C++ program. When is one method preferred over the other?**

Ans. A file can be opened in two ways :-

a) Using the constructor of the stream class – This method is useful when only one file is used in the stream.

Constructors of the stream classes ifstream, ofstream and fstream are used to initialize the file stream object with the file name. For example,

ifstream read_file("Names.Dat");

b) Using the function open() – This method is useful when we want to use different files in the stream. If two or more files are to be processed simultaneously, separate streams must be declared for each. For example, ifstream ifl; //input stream ifl created ifl.open("Names.Dat"); // file Names.Dat linked with ifl Second method is preferred over first method when there is a situation to open more than one file.

4.. Both ios::ate and ios::app place the file pointer at the end of the file when it is opened. What then, is the difference between them?

Ans. Both ios::ate and ios::app place the file pointer at the end of the file when it is opened. The difference between the two is that ios::app lets you add data to the end of the file only, while the ios::ate mode when opened with ofstream allows you to write data anywhere in the file, even over old data.

5. When a file is opened for output what happens when
(i) the mentioned file does not exist.
(ii) the mentioned file does exist.

Ans. (i) Creates a new file.

(ii) the act of opening a file for output scraps it off so that output starts with a fresh file.

6. Suggest the situation where write() and read() are preferred over get() and put() for file I/O operations. Support your answer with examples.

Ans. The get() and put() functions perform I/O byte by byte. On the other hand, read() and write() functions let you read and write structures and objects in one go without creating need for I/O for individual constituent fields.

Example:

```
file.get(ch);
file.put(ch);
file.read((char *)&obj, sizeof(obj));
file.write((char *)&obj, sizeof(obj));
```

7. Discuss the working of good() and bad() functions in file I/O error handling.

Ans. good(): Returns nonzero (true) if no error has occurred. For instance, if fin.good() is true, everything is okay with the stream named as fi and we can proceed to perform I/O operations. When it returns zero, o further operations can be carried out.

bad(): Returns true if a reading or writing operation fails. For example in the case that we try to write to a file that is not open for writing or if the device where we try to write has no space left.

8. A program to display the size of a file in bytes.

```
#include<iostream.h>
#include<fstream.h>
#include<process.h>
#include<conio.h>
int main()
{
        char filename[13];
        clrscr();
        cout<"Enter Filename:\n";
        cin.getline(filename,13);
        ifstream infile(filename);
        if(!infile)
                {cout>>"sorry ! Can not open "<<filename <<"file\n";
                exit(-1);
                }
        long no_bytes=0;
        char ch;
        infile.seekg(0,ios::end);
        no_bytes=infile.tellg();
        cout<<"File Size is"<<no_bytes<<"bytes\n";
        return 0;
}
```

9. C++ program, which initializes a string variable to the content "There is an island of opportunity in the middle of every difficulty." and output the string one character at a time to the disk file "OUT.TXT".

```
#include<fstream.h>
int main()
{       ofstream fout("OUT.TXT");
        char *str = "There is an island of opportunity in the middle of every difficulty." ;
        int i=0;
        if(!fout)
        {
                cout<<"File cannot be opened ";
                return 0;
        }
        while (str[i]!='\0')
        {fout<<str[i];
                i++;
        }
        fout.close();
}
```

10. Function to add more objects belonging to class JOKE at the end of JOKES.DAT file.

```
class JOKE{int jokeid; char type[5], jokedesc[200];
                public:
                void Newjokeentry(){cin>>jokeid>>type; cin.getline(jokedesc,200);}
                void showjoke(){cout<<jokeid<<"\t"<<type<<endl<<jokedesc<<endl;}
                };
void append()
{
        fstream afile;
        afile.open("JOKES.DAT", ios::binary | ios::app);
        JOKE j;
        int n,i;
        cout<<"How many objects you want to add :";
        cin>>n;
        for (i=0;i<n;i++)
        {
                j.Newjokeentry();
                afile.write((char *)& j, sizeof (JOKE));
        }
        afile.close();
}
```

CHAPTER – 6 (POINTER)

1. Write the output of the follwoing program segment

```
#include<iostream.h>
#include<string.h>
#include<ctype.h>
#include<stdio.h>
void main()
{
char *NAME="ComPUteR";
clrscr();
for(int x=0;x<strlen(NAME);x++)
```

```
{
if(islower(NAME[x]))
NAME[x]=toupper(NAME[x]);
else
if(isupper(NAME[x]))
  if(x%2==0)
    NAME[x]=tolower(NAME[x]);
  else
    NAME[x]=NAME[x-1];
}
puts(NAME);

}
```

Ans cOMMuTEE

2. What will be the output of the following program :

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

void changestring(char text[], int &counter)
{
        char *ptr = text;
        int length=strlen(text);
        for(;counter<length-2;counter+=2,ptr++)
        {
        *(ptr+counter) = toupper(*(ptr+counter));
        }
}
void main()
{
        clrscr();
        int position = 0;
        char message[]= "Mouse Fun";
        changestring(message,position);
        cout<<message<< "@" <<position;
}
```

Ans MouSe Fun@8

3. Find the output of the following program:

```
#include<iostream.h>
#include<string.h>
class student
{ char *name;
int I ;
public:
```

```
student( ) {I =0; name=new char [ I +1]; }
student (char *s)
{ I =strlen(s); name=new char[I+1];
strcpy (name,s);
}
void display( ) {cout<<name<<endl;}
void manipulate(student & a, student & b)
{ I = a.I + b.I;
delete name;
name=new char[I+1];
strcpy(name, a.name);
strcat(name, b.name);
}
};
void main( )
{ char * temp = "Jack";
student name1 (temp), name2(" Jill"), name3("John"),S1,S2;
S1 .manipulate (name1, name2);
S2.manipulate (S1, name3);
S1.display ( );
S2.display ( );
}
```

Ans

```
JackJill
JackJillJohn
```

4. Find the output of the following program:

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

void main( )
{ int *PointerArray[10];
int marks [] = {75, 68, 90, 34, 0, 10, 90, 65};
clrscr();
for (int I = 0; marks [I]!=0; I++)
{ PointerArray [I]=&marks[I];
* (PointerArray[I]) += 5;
}
int index = 0;
while(index<I)
{ int p=*(PointerArray[index] );
if(p>=60)
  cout<<p<< ", ";
index ++;
}
}
```

Ans

80 , 73 , 95,

5. Give the output of the following program :

```
#include<iostream.h>
#include<conio.h>
main( )
{
int a=0;
clrscr( );
char *name;
name= “Internet Browsing”;
for(a=0;a<=8;a++)
cout<<name[a+1];
cout<<endl;
cout<<name[a];
cout<<endl<<(int)name[a]-1;
getch( );
return 0;
}
```

Ans

Output

```
nternet B
B
65
```

6. Give the output of the following program :

```
#include<iostream.h>
#include<conio.h>
#include<stdio.h>
#include<string.h>
main( )
{
clrscr( );
char *name;
int len=0;
name= "Object Oriented Programming";
len = strlen(name);
len = len-1;
for(int i=len;i>=0;i=i-2)
{       cout<<name[i]<<" ";}

cout<<endl<<i<<endl;
cout<<name[i+4]<<endl;
cout<<endl;
getch();
return 0;
}
```

Ans

output
g i m r o P d t e r c j O
-2
j

7. What is the output of the following program(Assume all necessary header files are included) :

```
#include<iostream.h>
#include<conio.h>
#include<string.h>
void main( )
{
char * str = "TEACHER";
for ( int i = strlen(str) - 1 ; i >= 0 ; i --)
{
for ( int x = 0 ; x <= i ; x ++)
cout<<str[x] ;
cout<<"\n";
}
}
```

Ans

TEACHER
TEACHE
TEACH
TEAC
TEA
TE
T

8. What Are Pointers?

A **pointer** is a variable whose value is the address of another variable. Like any variable or constant, you must declare a pointer before you can work with it. The general form of a pointer variable declaration is:

type *var-name;

9. Question : What is pointer arithmetic ? How is it performed?

Answer : Some arithmetic operators can be used with pointers:

Increment and decrement operators ++, --

Integers can be added to or subtracted from pointers using the operators +, -, +=, and -=

Each time a pointer is incremented by 1, it points to the memory location of the next element of its base type.

If "p" is a character pointer then "p++" will increment "p" by 1 byte.

If "p" were an integer pointer its value on "p++" would be incremented by 2 bytes.

10. Question : What is this pointer? What is its Significance?

Answer : The this pointer is an object pointer which points to the currently calling object, The this pointer is, by default, available to each called member function.

CHAPTER – 7 (ARRAY – DATA STRUCTURE)

1.Write a function in C++ to replace the repeating elements in an array by 0 . The zeros should be shifted to the end. The order of the array should not change.
Eg : Array : 10 , 20 , 30 , 10 , 40 , 20 , 30
Result : 10 , 20 , 30 , 40 , 0 , 0 , 0

Ans.

```
void twodigit(int a[10],int n)
{ int i,j,temp;
for(i=0;i<n;i++)
for(j=i+1;j<n;j++)
{ if(a[i]==a[j])
a[j]=0;
}
for(i=0;i<n-1;i++)
if(a[i]==0)
{
temp=a[i];
a[i]=a[i+1];
a[i+1]=temp;
}
cout<<"\nResult :";
for(i=0;i<n;i++)
cout<<a[i]<<" ";
}
```

1. Write a function in C++ called shift( ) to rearrange the matrix as shown .

Original Matrix				Rearranged Matrix			
1	2	-3	-2	-3	-2	1	2
0	-1	2	1	-1	0	2	1
-3	9	-4	4	-3	-4	9	4

Ans.

```
void shift(int a[10][10],int m,int n)
{
int b[10][10]={0},i,j,k=0,c[10][10]={0};
for(i=0;i<m;i++)
{
k=0;
for(j=0;j<n;j++)
{
if(a[i][j]<0)
{
b[i][k]=a[i][j];
k++;
}
}
} for(i=0;i<m;i++)
{ k=n-1;
for(j=n-1;j>=0;j--)
{
if(a[i][j]>=0)
{ c[i][k]=a[i][j];
```

```
k--;
}
}
}
for(i=0;i<m;i++)
for(j=0;j<n;j++)
a[i][j]=b[i][j]+c[i][j];
for(i=0;i<m;i++)
{ cout<<endl;
for(j=0;j<n;j++)
cout<<a[i][j]<<" ";
}
}
```

2. Define a function SWAPARR( ) in c++ to swap the first row elements with the last row elements, for a 2d integer array passed as the argument of the function.

If the 2D array contains	After swapping of the contents of first and last row
5 6 3 2	9 7 5 8
1 2 4 9	1 2 4 9
2 5 8 1	2 5 8 1
9 7 5 8	5 6 3 2

Ans.

```
void SWAPARR(int a[10][10],int m,int n)
{
int i,j,temp;
for(i=0;i<n;i++)
{ temp=a[0][i];
a[0][i]=a[m-1][i];
a[m-1][i]=temp;}
cout<<"\nThe array after swapping";
for(i=0;i<m;i++)
{ cout<<endl;
for(j=0;j<n;j++)
cout<<a[i][j]<<" ";
}
}
```

3. Write a function in C++ which accepts an integer array M x N and its size as arguments and then displays the array after exchanging the elements in the upper half of the diagonal with the lower half of the diagonal, do not use parallel arrays.

Ans.

```
void exchange(int a[10][10],int m,int n)
{ int i,j,temp;
for(i=0;i<m;i++)
for(j=0;j<n;j++)
{ if(i>j)
{ temp=a[i][j];
a[i][j]=a[j][i];
a[j][i]=temp;
} }
cout<<"\nThe array after swapping";
```

```
for(i=0;i<m;i++)
{ cout<<endl;
for(j=0;j<n;j++)
cout<<a[i][j]<<" ";
}}
```

4. Write a function in C++ which accepts an integer array and its size as arguments and replaces elements having even values with its half and elements having off values with twice its value.
   Eg. If an array of five elements initially contains the elements as
   3,4, 5, 16, 9
   Then the function should rearrange the content of the array as
   6, 2, 10, 8, 18

Ans.

```
void change(int a[10],int n)
{
int i;
for(i=0;i<n;i++)
{
if(a[i]%2==1)
a[i]=a[i]*2;
else if(a[i]%2==0)
a[i]=a[i]/2;
}
for(i=0;i<n;i++)
cout<<a[i]<<" ";
}
```

5. Define a function COPY( ) to copy the last five elements of array B after first 5 elements of array A and store it in the third array C.

Ans.

```
void extra(int a[10],int b[10],int n)
{
int c[30],counta=0,countb=n-1,countc=0,i;
while(countc<5)
{ c[countc]=a[counta];
counta++;
countc++;
}
while(countc<10)
{ c[countc]=b[countb];
countb--;
countc++;
}
for(i=0;i<10;i++)
cout<<c[i]<<" ";
}
```

6. Write a function which finds the locations and values of largest and second largest element in a two dimensional array with M rows and N columns.

Ans.

```
void largest(int a[10][10],int m,int n)
{
int i,j,pr1=0,pc1=0,pr2=0,pc2=0,fl=a[0][0],sl=0;
for(i=0;i<m;i++)
for(j=0;j<n;j++)
{
if(a[i][j]>fl)
{
fl=a[i][j];
pr1=i;
pc1=j;
}
if((a[i][j]>sl) && a[i][j]<fl)
{
sl=a[i][j];
pr2=i;
pc2=j;
}
}
cout<<"\nLargest Element is "<<fl<<" and is stored at row "<<pr1<<" and column "<<pc1;
cout<<"\nSecond Largest Element is "<<sl<<" and is stored at row "<<pr2<<" and column
"<<pc2;
}
```

8. Write a function in C++ which accepts an integer array of double dimensional with its size as arguments and displays the total numbers of odd, even and prime numbers in the array. Example : if the following integer array will be passed to the function, i.e.

6	4	13	19	5
7	3	8	11	51
9	12	23	4	6
21	29	18	9	10
28	5	12	2	6

Then the output should be : The total odd numbers are : 13
The total odd numbers are : 12
The total odd numbers are : 10

Ans :
```
void numcheck( int arr[ ][ ], int m, int n)
    {
        int i, j, oddt=0, event=0, primet=0, nf, k;
        for(i=0; i<m; i++)
        {
            for(j=0; j<n; j++)
            {
                if(arr[i][j] % 2 = = 0)
                    event++;
                else
                    oddt++;
                nf=0;
                for(k=1; k<=arr[i][j]; k++)
                {
                    if(arr[i][j] % k = = 0)
                        nf++;
```

```
                    }
                    if(nf = = 2)
                        primet++;
                }
            }
            cout<<"\nThe total odd numbers are : "<<oddt;
            cout<<"\nThe total even numbers are : "<<event;
            cout<<"\nThe total prime numbers are : "<<primet;
        }
```

9. An array P[20][30] is stored in the memory along the column with each of the element occupying 4 bytes, find out the Base Address of the array, if an element P[2][20] is stored at the memory location 5000.

Ans : Given, W=4, N=20, M=30, Loc(P[2][20])=5000

Column Major Formula:

Loc(P[I][J]) =Base(P)+W*(N*J+I)
Loc(P[2][20]) =Base(P)+4*(20*20+2)
Base(P) =5000 – 4*(400+2)
=5000 – 1608
=3392

10. An array ARR[5][25] is stored in the memory with each element occupying 4 bytes of space. Assuming the base address of ARR to be 1000, compute the address of ARR[5][7], when the array is stored as :
(i) Row wise (ii) Column wise.

Ans:

(i) Row wise :	(ii) Column wise :
Given, W = 4, N = 5, M = 25, Base(ARR) = 1000	Given, W = 4, N = 5, M = 25, Base(ARR) = 1000
Row Major Formula: Loc(ARR[5][7])= Base(ARR)+W*(M*I+J)	Column Major Formula: Loc(ARR[5][7])= Base(ARR)+W*(N*J+I)
= 1000 + 4*(25*5 + 7) = 1000 + 4 * 132 = 1000 + 528 = 1528	= 1000 + 4*(5*7 + 5) = 1000 + 4 * 40 = 1000 + 160 = 1160

CHAPTER – 8 (STACK & QUEUE)

1.Write a function in C++ to replace the repeating elements in an array by 0 . The zeros should be shifted to the end. The order of the array should not change.
Eg : Array : 10 , 20 , 30 , 10 , 40 , 20 , 30
Result : 10 , 20 , 30 , 40 , 0 , 0 , 0

Ans.

```
void twodigit(int a[10],int n)
{ int i,j,temp;
for(i=0;i<n;i++)
for(j=i+1;j<n;j++)
{ if(a[i]==a[j])
a[j]=0;
}
```

```
for(i=0;i<n-1;i++)
if(a[i]==0)
{
temp=a[i];
a[i]=a[i+1];
a[i+1]=temp;
}
cout<<"\nResult :";
for(i=0;i<n;i++)
cout<<a[i]<<" ";
}
```

2. Write a function in C++ called shift( ) to rearrange the matrix as shown .

Original Matrix				Rearranged Matrix			
1	2	-3	-2	-3	-2	1	2
0	-1	2	1	-1	0	2	1
-3	9	-4	4	-3	-4	9	4

Ans.

```
void shift(int a[10][10],int m,int n)
{
int b[10][10]={0},i,j,k=0,c[10][10]={0};
for(i=0;i<m;i++)
{
k=0;
for(j=0;j<n;j++)
{
if(a[i][j]<0)
{
b[i][k]=a[i][j];
k++;
}
}
} for(i=0;i<m;i++)
{ k=n-1;
for(j=n-1;j>=0;j--)
{
if(a[i][j]>=0)
{ c[i][k]=a[i][j];
k--;
}
}
}
for(i=0;i<m;i++)
for(j=0;j<n;j++)
a[i][j]=b[i][j]+c[i][j];
for(i=0;i<m;i++)
{ cout<<endl;
for(j=0;j<n;j++)
cout<<a[i][j]<<" ";
```

}
}

CHAPTER – 9 (DATABASE MANAGEMENT SYSTEM – DBMS)

1. In a Database Multiplexes, there are two tables with the following data. Write MySQL queries for (i) to (iii), which are based on TicketDetails and AgentDetails :

Table: TicketDetails

Tcode	Name	Tickets	A_code
S001	Meena	7	A01
S002	Vani	5	A02
S003	Meena	9	A01
S004	Karish	2	A03
S005	Suraj	1	A02

Table: AgentDetails

Acode	AName
A01	Mr. Robin
A02	Mr. Ayush
A03	Mr. Trilok
A04	Mr. John

(i) To display Tcode, Name and Aname of all the records where the number of tickets sold is more than 5.
(ii) To display total number of tickets booked by agent "Mr. Ayush".
(iii) To display Acode, Aname and corresponding Tcode where Aname ends with 'k'.

Ans:

(i)
```
SELECT Tcode, Name, Aname
 FROM TicketDetails t, AgentDetails a
 WHERE a.Acode=t.Acode;
```

(ii)
```
SELECT SUM(Tickets)
FROM TicketDetails t, AgentDetails a
WHERE a.Acode=t.Acode AND Aname='Mr. Ayush';
```

(iii)
```
SELECT Acode, Aname, Tcode
FROM TicketDetails t, AgentDetails a
WHERE a.Acode=t.Acode and Aname LIKE '%K';
```

2. With reference to "TicketDetails" table, which column is the primary key ? Which column is the foreign key? Give reason(s).

Ans: Primary Key: Tcode Foreign Key: Acode

3 Differentiate between count( ) & count(*).

Ans: Count( ) will count the number of tuples excluding NULL values. Count(*) will count the total number of rows in a table including NULL values.

4 Write SQL commands for (i) to (v) for the given table Employee.

Table: Employee

EmpNo	Name	Designation	Dept	Salary
2045	Kumar	Clerk	Finance	15000
1265	Pratap	Manager	Finance	25000
4502	Lakhan	Account	Finance	20000
4007	Jia	Clerk	Computer	12500
1101	Krishna	Administrator	Purchase	32500

(i) Display all the records of the table Employee

(ii) Display name and designation of employee order by name

(iii) Display different department having designation Clerk.

(iv) Display all employees details whose department is Finance and salary is more than 20000.

(v) Find out the maximum salary of the employee.

Ans:

(i)
```
SELECT *
FROM Employee;
```

(ii)
```
SELECT Name, Designation
FROM Employee
ORDER BY Name;
```

(iii)
```
SELECT Dept
FROM Employee
WHERE Designation = 'Clerk';
```

(iv)
```
SELECT *
FROM Dept
WHERE Dept = 'Finance' AND Salary>20000;
```

(v)
```
SELECT MAX(Salary)
FROM Employee;
```

5 Mr. Sondhi created two tables with DEPTNO as primary key in Table1 and foreign key in Table2. While inserting a row in Table2, Mr. Sondhi is not able to enter a value in the column DEPTNO. What could be the possible reason for it?

Ans: The possible reason could be the DEPTNO being entered in Table2 is not present in Table1 i.e. the referential integrity is imposed.

6. What do you understand by the terms Alternate key and Foreign Key of a relation?

Ans : AlternateKey:Candidate key not selected as PrimaryKey.

ForeignKey: Key which is primary in one table if it exist in other table it is called Foreign in that table. OR Key whose underlying value depend s on the field where it is primary

7 Consider the following tables Stationary and Consumer. Write SQL commands for the statement (i) to (iv).

Table:Stationary

S_ID	StationaryName	Company	Price
DP01	Dot Pen	ABC	10
PL02	Pencil	XYZ	6
ER05	Eraser	XYZ	7
PL01	Pencil	CAM	5
GP02	Gel Pen	ABC	15

Table:Consumer

C_I	ConsumerName	Address	S_ID
01	GoodLearner	Delhi	PL01
06	Write Well	Mumbai	GP02
12	Topper	Delhi	DP01
15	Write &Draw	Delhi	PL02
16	Motivation	Bangalore	PL01

(i) To display the details of those consumers whose Address is Delhi.
(ii) To display the details of Stationary whose Price is in the range of 8to 15. (Both Value in cluded)
(iii) To display the ConsumerName, Address from Table Consumer,and Company and PricefromtableStationary,with theircorrespondingmatchingS_ID.
(iv) To increase the Price of all stationaryby2.

Ans:

i)Select * from consumer where Address='Delhi';
ii) Select * from Stationarywhere price between 8and 15.
iii) SelectConsumerName,Address , Company,PricefromConsumer, StationarywhereConsumer.S_ID= Stationary.S_ID ;
iv)Update StationarysetPrice =Price+2;

Q8 : Given below is a table Patient.

Table: Patient

Name	P_No	Date_Admn	Doc_No
Vimla Jain	P0001	2011-10-11	D201
Ishita Kohli	P0012	2011-10-11	D506
Karan Verma	P1002	2011-10-17	D201
Karan Verma	P1567	2011-11-22	D233

(i) Identify the primary key in the given table.
(ii) Write MySQL query to add a column Department with data type varchar and size 30 in the table Patient.

Ans:

(i) Primary key: P_No.
(ii) ALTER TABLE Patient ADD (Department varchar(30));

9. State difference between date functions NOW( ) and SYSDATE( ) of MySql.
Ans: SYSDATE( ) returns the time at which it executes. This differs from the behaviour for NOW(), which returns a constant time that indicates the at which the statement began to execute.

10 Explain FOREIGN KEY and Refrential Integrity with example.

Foreign Key: It is a column of a table which is the primary key of another table in the same database. It is used to enforce referential integrity of the data.

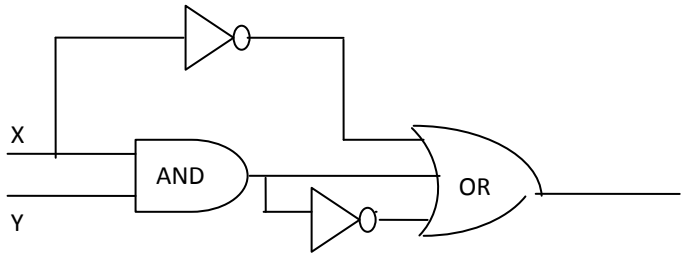
• **Referential Integrity:** The property of a relational database which ensures that no entry in a
foreign key column of a table can be made unless it matches a primary key value in the corresponding column of the related table.

CHAPTER – 10 (BOOLEAN ALGEBRA)

Q1: Prove (x+y)(x+z) = x+yz algebraically.
L.H.S. = (x+y).(x+z)
=Xx+xz+xy+yz
BECAUSE XX = X (FROM IDEMPOTENCE LAW) SO
=X+XZ+XY+YZ
=X+XY+XZ+YZ
=X(1+Y)+Z(X+Y)
BECASE 1+Y = 1 (PROPERTY OF 0 AND 1) SO
=X.1+Z(X+Y)
BECASE 1.X = X (PROPERTY OF 0 AND 1) SO
=X+XZ+YZ
BECASE 1+X = 1 (PROPERTY OF 0 AND 1) SO
=X(1+Z)+YZ
=X.1+YZ
BECAUSE X.1 = X (PROPERTY OF 0 AND 1) SO
=X+YZ

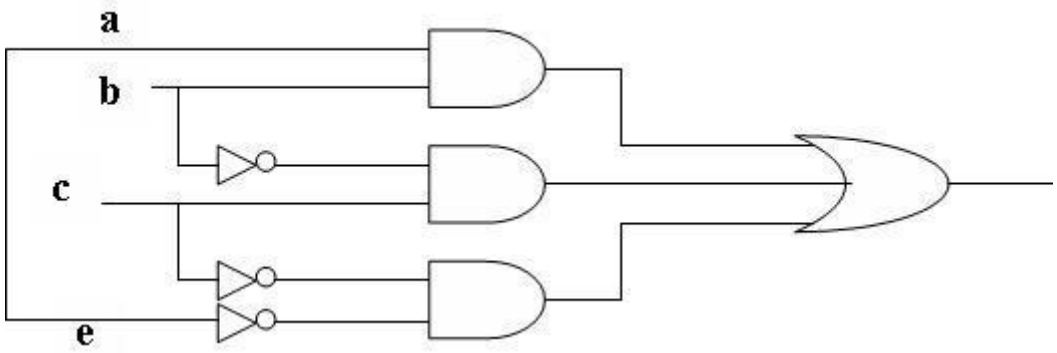
Q2: Prove x'.y'+y.z = x'yz+x'yz'+xyz+x'yz algebraically.
Ans: *L.H.S.= x'y +y.z*
=x'y.1+1.y.z =x'y(z+z')+(x+x')y.z
=x'yz+x'yz'+xyz+x'yz =RHS

Q3: Write the equivalent Boolean Expression for the following Logic Circuit.



Ans: X'+X.Y+(X.Y)'

Q4. Interpret the following logical circuit as Boolean expression



Ans: ***ab+b'c+c'e'***

Q5: Express the F(X,Z)=X+X'Z into canonical SOP form.
Ans: *F(X,Z)=X+X'Z =X(Y+Y')+X'(Y+Y')Z*
=XY+XY'+X'YZ+X'Y'Z
=XY(Z+Z')+XY'(Z+Z')+X'YZ+X'Y'Z
=XYZ+XYZ'+XY'Z+XY'Z'+X'YZ+X'Y'Z

Q6: Write the POS and the SOP form of a Boolean function F, which is represented in a truth table as follows:

W	X	Y	Z	F
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

Ans :

W	X	Y	Z	F	MINTERM	MAXTERM
0	0	0	0	0		W+X+Y+Z
0	0	0	1	1	W'X'Y'Z	
0	0	1	0	0		W+X+Y+Z'
0	0	1	1	1	W'X'YZ	
0	1	0	0	1	W'XY'Z'	
0	1	0	1	0		W+X'+Y+Z'
0	1	1	0	1	W'XYZ'	
0	1	1	1	1	W'XYZ	
1	0	0	0	0		W'+X+Y+Z
1	0	0	1	1	WX'Y'Z	
1	0	1	0	0		W'+X+Y'+Z
1	0	1	1	1	WX'YZ	
1	1	0	0	1	WXY'Z'	
1	1	0	1	0		
1	1	1	0	0		W'+X'+Y'+Z
1	1	1	1	1	WXYZ	

SOP :
W'X'Y'Z + W'X'YZ+W'XY'Z'+ W'XYZ'+ W'XYZ+ WX'Y'Z+ WX'YZ+ WXY'Z'+ WXYZ
POS :
(W+X+Y+Z).(W+X+Y+Z').(W+X'+Y+Z').(W'+X+Y+Z).(W'+X+Y'+Z).(W'+X'+Y'+Z)

Q7: Prove that (a'+b')(a'+b)(a+b')=a'b'.
Ans: *LHS=(a'+b')(a'+b)(a+b')*
=(a'a'+a'b+a'b'+b'b)(a+b')
=(a'+a'b+a'b'+0)(a+b')
=aa'+a'b'+aa'b+a'bb'+a'ab'+a'b'b'

=0+a'b'+0+0+0+0+a'b'=a'b'=RHS

Q8: Simplify the following Boolean Expression using Boolean postulates and laws of Boolean Algebra.

Z=(a'+a).b'.c+a.b'.c'+a.b.(c+c')

Ans: *Z=(a'+a).b'.c+a.b'.c'+a.b.(c+c')*

RHS=(a'+a).b'.c+a.b'.c'+a.b.(c+c')

=a'bc+ab'c+ab'c'+ab.1

=a'bc+ab'c'+ab'c

=ab'(c+c')+ab'c

=ab'+ab'c

=ab'(1+c)

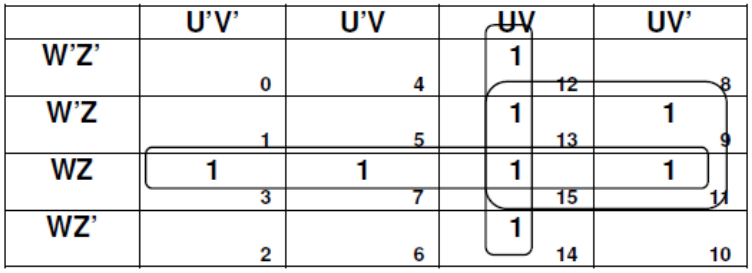
=ab'

Q9: Reduce the following Boolean Expression using K-Map

F(UVWZ) = ∏ (0,1,2,4,5,6,8,10)

Ans: *=∑(3,7,9,11,12,13,14,15)*

After that Draw the K map and solve using SOP form

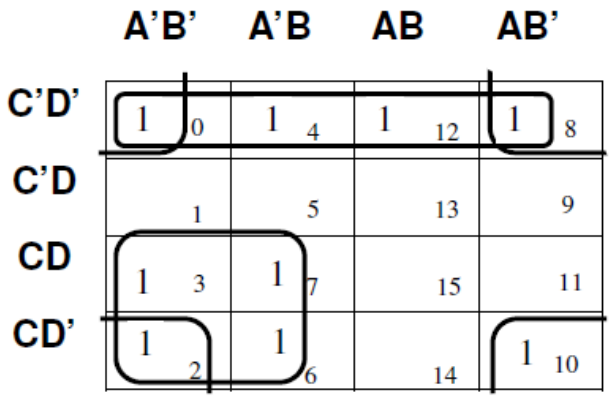


F(U,V,W,Z)=UV+WZ+UZ

Q10: Reduce the following Boolean expression using K – Map

F (A, B, C, D) =Σ (0,2,3,4,6,7,8,10,12)

Ans:



F= C'.D' + A'.C + B'.D'

CHAPTER – 11 (NETWORKING & OPEN SOURCE SOFTWARE)

Ques 1. Knowledge Supplement Organisation has set up its new center at Mangalore for its office and web based activities. It has 4 blocks of buildings as shown in the diagram below:

Center to center distances between various blocks

Block A to Block B	50 m
Block B to Block C	150 m
Block C to Block D	25 m
Block A to Block D	170 m
Block B to Block D	125 m
Block A to Block C	90 m

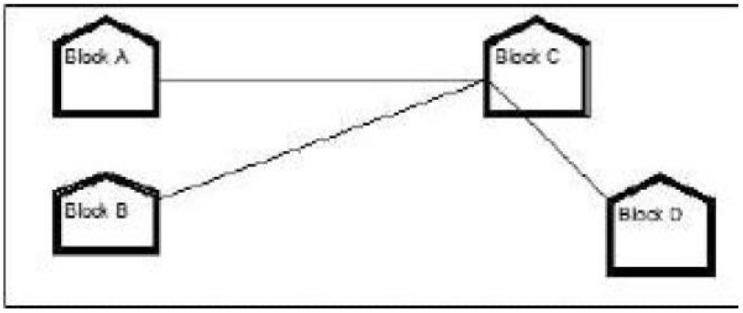
Number of Computers

Black A	25
Block B	50
Block C	125
Block D	10

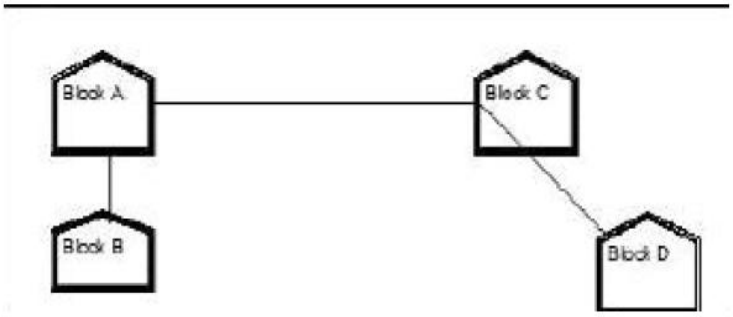
- Suggest a cable layout of connections between the blocks.
- Suggest the most suitable place (i.e. block) to house the server of organisation with a suitable reason.
- Suggest the placement of the following devices with justification
    - Repeater
    - Hub/Switch
- The organization is planning to link its front office situated in the city in a hilly region where cable connection is not feasible, suggest an economic way to connect it with reasonably high speed?

Ans: (Any of the following option)

Layout Option 1



Layout Option 2



(2) The most suitable place / block to house the server of this organisation would be Block C, as this block contains the maximum number of computers, thus decreasing the cabling cost for most of the computers as well as increasing the efficiency of the maximum computers in the network.

(3) (i) For Layout 1, since the cabling distance between Blocks A and C, and that between B and C are quite large, so a repeater each, would ideally be needed along their path to avoid loss of signals during the course of data flow in these routes. For layout 2, since the distance between Blocks A and C is large so a 124 repeater would ideally be placed in between this path.

(ii) In both the layouts, a hub/switch each would be needed in all the blocks, to interconnect the group of cables from the different computers in each block.

(4) The most economic way to connect it with a reasonable high speed would be to use radio wave transmission, as they are easy to install, can travel long distances, and penetrate buildings easily, so they are widely used for communication, both indoors and outdoors. Radio waves also have the advantage of being omni directional, which is they can travel in all the directions from the source, so that the transmitter and receiver do not have to be carefully aligned physically.

Ques2: 2. Ravya Industries has set up its new center at Kaka Nagar for its office and web based activities. The company compound has 4 buildings as shown in the diagram below:

Center to center distances between various buildings is as follows:

Harsh Building to Raj Building	50 m
Raz Building to Fazz Building	60 m
Fazz Building to Jazz Building	25 m
Jazz Building to Harsh Building	170 m
Harsh Building to Fazz Building	125 m
Raj Building to Jazz Building	90 m

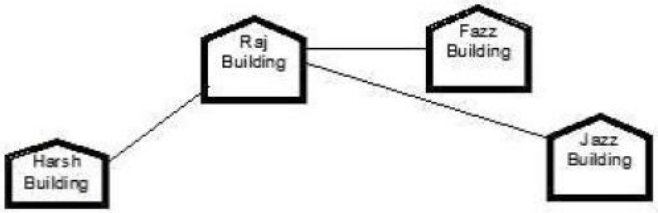
Number of Computers in each of the buildings is follows:

Harsh Building	15
Raj Building	150
Fazz Building	15
Jazz Bulding	25

e1) Suggest a cable layout of connections between the buildings.
e2) Suggest the most suitable place (i.e. building) to house the server of this organisation with a suitable reason.
e3) Suggest the placement of the following devices with justification:
(i) Internet Connecting Device/Modem
(ii) Switch
e4) The organisation is planning to link its sale counter situated in various parts of the same city, which type of network out of LAN, MAN or WAN will be formed? Justify your answer.

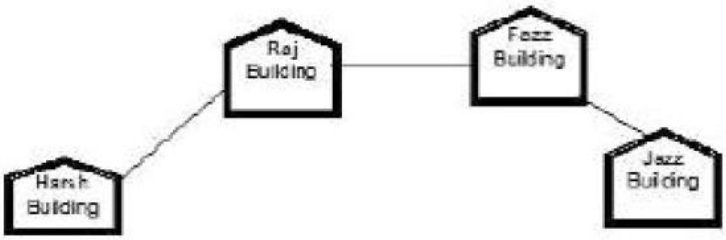
Ans:

2. (e1) Any one layout



Layout option1

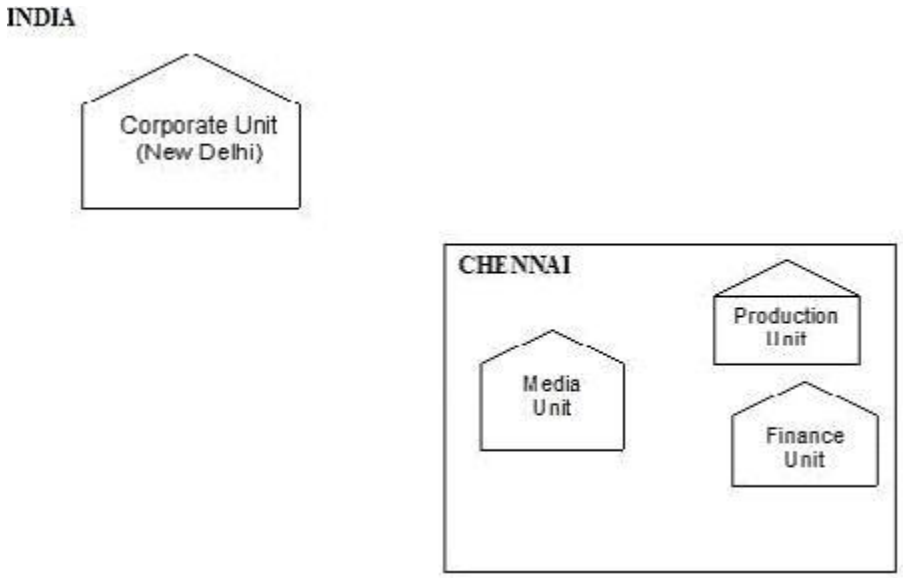
Layout option 2



(e2) The most suitable place / block to house the server of this organisation would be Raj Building, as this block contains the maximum number of computers, thus decreasing the cabling cost for most of the computers as well as increasing the efficiency of the maximum computers in the network.

(e3)(i) Raj Building
(ii) In both the layouts, a hub/switch each would be needed in all the buildings, to interconnect the group of cables from the different computers in each block e4) MAN, because MAN (Metropolitan Area Networks) are the networks that link computer facilities within a city.

3. "China Middleton Fashion" is planning to expand their network in India, starting with two cities in India to provide infrastructure for distribution of their product. The company has planned to set up their main office units in Chennai at three locations and have named their offices as "Production Unit", "Finance Unit" and "Media Unit". The company has its corporate unit in New Delhi.



Approximate distances between these Units is as follows:

From	To	Distance
Production Unit	Finance Unit	70 Mtr
Production Unit	Media Unit	15 KM
Production Unit	Corporate Unit	2112 KM
Finance Unit	Media Unit	15 KM

In continuation of the above, the company experts have planned to install the following number of computers in each of their office units:

Production Unit	150
Finance Unit	35
Media Unit	10
Corporate Unit	30

i) Suggest the kind of network required (out of LAN,MAN,WAN) for connecting each of the following office units:

• Production Unit and Media Unit
• Production Unit and Finance Unit

ii) Which one of the following devices will you suggest for connecting all the computers within each of their office units?

• Switch/Hub
• Modem
• Telephone

iii) Which of the following communication media, will you suggest to be procured by the company for connecting their local offices in Chennai for very effective (High Speed) communication?

• Ethernet cable
• Optical fiber
• Telephone cable

(iv) Suggest a cable/wiring layout for connecting the company's local office units located in Chennai. Also, suggest an effective method/technology for connecting the company's office unit located in Delhi.

ANS:

3. (i)(a) Production Unit and Media Unit :MAN
(b)Production Unit and Finance Unit:LAN
(ii) Switch/Hub
(iii) Optical fiber
(iv) Optical Fiber/Star Topology Wireless/Satellite Link/Leased Line

4. What is point-to-point protocol?

Ans. A communication protocol used to connect computer to remote networking services include Internet Service Providers. In networking, the Point-to-Point protocol is commonly used to establish a direct connection between two nodes. Its primary use has been to connect computers using a phone line.

5. How gateway is different from router?

Ans. A gateway operates at the upper levels of the OSI model and translates information between two completely different network architectures. Routers allow different networks to communicate with each other. They forward packets from one network to another based on network layer information. A gateway can interpret and translate the different protocols that are used on two distinct networks. Unlike routers that successfully connect networks with protocols that are similar, a gateway perform an application layer conversion of information from one protocol stack to another.

6. What is the role of network administrator?

Ans. Basic tasks for which a network administrator may be responsible:

 Setting up and configuring network hardware and software.
 Installing and configuring network media and connections.
 Connecting user nodes and peripherals of all kinds to the network.
 Adding users to and removing users from the network.
 Managing user account.

 Ensuring the security of the network.
 Provide training to the users to utilize the network's resources.

7. What is the difference between baseband and broadband transmission?
Ans. Baseband is a bi-directional transmission while broadband is a unidirectional transmission. No Frequency division multiplexing possible in base band but possible in broadband.
SNo Baseband Broadband
1 Entire bandwidth of the cable is consumed by a signal broadband transmission, signals are sent on multiple frequencies, allowing multiple signals to be sent simultaneously.
2 Digital signals Analog signals
3 bi-directional transmission unidirectional transmission
4 No Frequency division multiplexing possible Frequency division multiplexing possible
5 Uses for short distance Uses for long distance

8. What are the difference between domain and workgroup?
Ans.
SNo Domain Workgroup
1. One or more computers are servers All Computers are peers.
2. If you have a user account on the domain, you can logon to any computer on the domain. Each computer has a set of accounts.
3. There can be 100+ computers Typically not more then 20-30 computers
4. The computers can be on different local network All computers must be on the same local netork.

9. What is the differences between POP3 and IMAP Mail Server?
Ans. IMAP is a standard protocol for accessing e-mail from a local server. A simpler e-mail protocol is Post Office Protocol 3 (POP3), which download mail to the computer and does not maintain the mail on the server. IMAP, e-mails are stored on the server, while in POP3, the messages are transferred to the client's computer when they are read.

10. Name different layer of the ISO OSI Model.
Ans. International Standard Orrganisation – Open Systems Interconnection has seven layers; Physical Layer,Data Link Layer,Network Layer,Transport Layer,Session Layer,Presentation Layer Application Layer

11. What is client server architecture?
Ans. To designated a particular node which is well known and fixed address, to provide a service to the network as a whole. The node providing the service is known as the server and the nodes that use that services are called clients of that server. This type of network is called Client-Server Architecture.

12. What is FDM? Give example.
Ans. FDM-Frequency Division Multiplexing is used in analog transmission. It is often used in short distance. It is code transparent and any terminal of the same speed can use the same sub-channel after the sub-channel is established. The best example if FDM is the way we receive various stations in a radio.

13. Describe the following in brief:
i) MOSAIC ii) USENET iii) WAIS
Ans. i) MOSAIC: is the program for cruising the internet. The National centre wrote this program for Super Computer application at the university of Illinois. It has a simple window interface, which creates useful hypertext links that automatically perform some of the menu bar and button functions.

ii) USENET: is the way to meet people and share information. Usenet newsgroup is a special group set up by people who want to share common interests ranging from current topic to cultural heritages.

iii) WAIS: is a WIDE AREA INFORMATION SERVER.