

INTERNATIONAL INDIAN SCHOOL, DAMMAM

Model Examination – January 2018

Computer Science – Class XII

Set A

Time: 3 Hrs

Marks: 70

1. (a) What is the difference between Actual Parameter and Formal Parameter? Explain with suitable example. (2)

- (b) Write the names of the header files needed for successful compilation and execution of the following code : (1)

```
void main()
{
    int Last=5;
    cout<<pow(Last,3);
}
```

- (c) Rewrite the following C++ program after removing all the syntactical errors (if any), underlining each correction. (2)

```
#include<iostream.h>
CLASS PAYITNOW
{
    int Charge;
public:
    void Raise( ) { cin>>Charge; }
    void Show { cout<<Charge; }
}
void main( )
{
    PAYITNOW P;
    P.Raise( );
    Show( );
}
```

- (d) Find and write the output of the following C++ program code : (2)
Note: Assume all required header files are already included in the program.

```
void Reposition(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[ ]="SUCCEDED";
```

```

    cout<<"Initial String:"<<STR;
    Reposition(STR);
    cout<<"\n New String:"<<STR;
}

```

- (e) Find and write the output of the following C++ program code : (3)
 Note: Assume all required header files are already included in the program.

```

void ChangeArray(int number, int ARR[ ], int Size)
{
    for(int L=0; L<Size; L++)
    {
        if(L<number)
            ARR[L]+=L;
        else
            ARR[L]*=L;
    }
}

void Show(int ARR[ ], int Size)
{
    for(int L=0; L<Size; L++)
        (L%2==0)?cout<<ARR[L]<<"#" : cout<<ARR[L]<<endl;
}

void main( )
{
    int Array[ ]={50, 60, 10, 40, 20, 30};
    ChangeArray(4, Array, 6);
    Show(Array, 6);
}

```

- (f) Study the following program and select possible output(s) from the option (i) to (iv) (2)
 following it. Also find the maximum and the minimum values that can be assigned to the variable 'p'.

Note: Assume all required header files are already being included in the program.
random(n) function generates integers between 0 and n-1.

```

void main( )
{
    randomize( );
    char colorname[ ][10]={"White", "Pink", "Red", "Orange"};
    int p;
    for(int a=0; a<=2; a++)
    {
        p=random(2)+1;
        cout<<colorname[p]<<":" ;
    }
}

```

Output

- | | |
|------------------------|----------------------|
| (i) Pink:Red:Pink: | (ii) White:Pink:Red: |
| (iii) Pink:Red:Orange: | (iv) Pink:Red:Red: |

2. (a) What do you understand by Polymorphism? Also, give a suitable C++ code to (2)
 illustrate the same

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

```
class employee
{
    int pay;
    char address[20];
public:
    employee(int y) { pay = y; }           //constructor 1
    employee(int P, char ADDR[])         //constructor 2

};
```

- i) Create an object, such that it invoke constructor 1.
ii) Write complete definition for constructor 2.

- (c) Define a class CLOTHING with the following description:- (4)

Private members:

- CCode of type string
- CType of type string
- CSize of type integer
- CFabric of type string
- CPrice of type float
- A function Assign() which calculates and assigns the value of CPrice as follows:

For CFabric as "COTTON"

CType	CPrice
TROUSER	1500
SHIRT	1200

For Material other than "COTTON" the above mentioned CPrice gets reduced by 25%.

Public Members:

A constructor to assign initial values of CCode, CType and CFabric with the word "NOT ASSIGNED" and CSize and CPrice with 0.

A function Enter() to input the values of the data members CCode, CType, CSize and CFabric and invoke the Assign() function.

A function Show() which displays the content of all the data members for CLOTHING.

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

```
class LivingBeing
{
    char specification[20];
    int averageage;
public:
    void read( );
    void show( );
};
class Ape : public LivingBeing
{
    int no_of_organ, no_of_bones;
protected:
    int iq_level;
public:
    void readape( );
    void showape( );
};
```

```
class Human : private Ape
{
```

```
    char race[20];
    char habitation[30];
```

```
public:
```

```
    void readhuman( );
    void showhuman( );};
```

(i) Name the members, which can be accessed from the member functions of class Human.

(ii) Name the members, which can be accessed by an object of class Ape.

(iii) Name the members, which can be accessed by an object of class Human.

(iv) What will be the size of an object (in bytes) of class Human.

3. (a) Write the definition of a function `grace_score (int score [], int size)` in C++, which should check all the elements of the array and give a decrease of 5 to those scores which are more than 80. (3)

Example: if an array of seven integers is as follows:

45, 35, 85, 92, 33, 87, 90

After executing the function, the array content should be changed as follows:

45, 35, 80, 87, 33, 82, 85

- (b) An array `A[50][100]` is stored along the column in the memory with each element occupying 2 bytes of storage. Find out the address of the element `A[25][50]`, if the location of element `A[10][20]` is stored at the address 10000. (3)

- (c) Write the definition of a member function `POP()` for a class `STACK` in C++ to delete a node containing student's information from a dynamically allocated stack of students considering the following code is already written as a part of the program (assume all necessary header files are included in program): (4)

```
struct Student
{
    int RNO;
    char Name[30];
    Student *Next;
};
```

```
class STACK
{
    Student *TOP;
public:
    STACK()
    {
        TOP=NULL;
    }
    void PUSH();
    void POP();
};
```

- (d) Write a function in C++ to print the sum of all the even elements present on both the diagonal of a two dimensional array passed as the argument to the function. (2)

- (e) Evaluate the following POSTFIX expression. Show the status of Stack after execution of each operation separately: (2)

55, 60, +, 10, 16, -, 3, *, +

4. (a) Assuming that a text file named FIRST.TXT contains some text written into it, write a function named VowelWords(), that reads FIRST.TXT and creates a new file named SECOND.TXT, to contain only those words from the file FIRST.TXT, which do not start with a lowercase vowel (i.e. with 'a', 'e', 'i', 'o', 'u'). (2)

Example:

If the content of FIRST.TXT is:

Carry umbrella and overcoat when it rains.

Then, the file SECOND.TXT shall contain:

Carry when rains

- (b) Consider a binary file "CUSTOMER.DAT", containing objects of the following class: (3)

```
class CUSTOMER
{
    int CId;           //Customer Id
    char CName[30];    //Customer Name
    char Category;     //Customer Type: 'G' for General 'N' for Not General
public:
    void Buy( );       //function to Buy goods
    void Display( );   //function to display details
    char GetCategory( )
    {
        return Category;
    }
};
```

Write a function in C++ to read and display the details of all the customers whose Category is 'G'.

- (c) Find the output of the following C++ code considering that the binary file STUDENT.DAT already exists on the hard disk with records 20 students. (1)

```
class student
{
    int admno;
    char name[20];
public:
    void getdata( )
    {
        cout<<" \nEnter the admission no: ";
        cin>>admno;
        cout<<" \nEnter name of the student: ";
        gets(name); }
    void showdata( )
    {
        cout<<" \n Admission No: " <<admno;
        cout<<" \n Name: ";
        puts (name);
    }
};
```

```

int retadmno() {
    return admno;
} };
void main()
{
    fstream SF;
    SF.open("STUDENT.DAT", ios::binary | ios::out | ios::app);
    student S;
    S.getdata();
    SF.write(char*)&S, sizeof(S);
    S.getdata();
    SF.write(char*)&S, sizeof(S);
    int LOC=SF.tellp()/sizeof(S);
    cout<<"Total records in file:"<<LOC;
    SF.close();
}

```

5. (a) Define degree and cardinality of a relation. What is the degree and cardinality of the given table. (2)

M_Id	M_Company	M_Name	M_Price	M_Mf_Date	M_Supplier
MB001	Samsung	Galaxy	4500	2013-02-12	New Vision
MB003	Nokia	N1100	2250	2011-04-15	Praveen Gallery
MB004	Micromax	Unite3	4500	2016-10-17	Mobile Center
MB005	Sony	XperiaM	7500	2017-11-20	A-one Mobiles
MB006	Oppo	SelfieEx	8500	2010-08-21	The Mobile

- (b) Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables given below: (6)

Table: Employees

Empid	Firstname	Lastname	Address	City
010	Ravi	Kumar	Raj Nagar	GZB
105	Harry	Waltor	Gandhi Nagar	GZB
152	Sam	Tones	33 Elm St	Paris
215	Sarah	Ackerman	440 U.S. 110	Upton
244	Manila	Sengupta	24 Friends Street	New Delhi
300	Robert	Samuel	9 Fifth Cross	Washington
335	Ritu	Tondon	Shastri Nagar	GZB
400	Rachel	Lee	121 Harrison Street	New York
441	Peter	Thompson	11 Red Road	Paris

Table: EmpSalary

Empid	Salary	Benefits	Designation
010	75000	15000	Manager
105	65000	15000	Manager
152	80000	25000	Director
215	75000	12500	Manager
244	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman

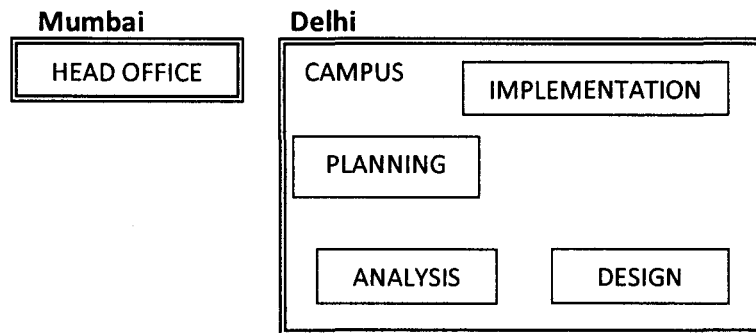
- (i) To display firstname, lastname, address and city of all employees not living in Paris.
- (ii) To display the content of Employees table in ascending order of Firstname.
- (iii) To display the firstname, lastname and total_salary of all managers from the tables Employees and EmpSalary, where total_salary is calculated as salary+benefits.
- (iv) To display the minimum salary among Salesmam and Clerks from the table EmpSalary.
- (v) Select firstname,salary from Employees ,EmpSalary where designation = 'Manager' and Employees.Empid = EmpSalary.Empid;
- (vi) Select count(distinct benefits) from EmpSalary;
- (vii) Select designation, sum(salary) from EmpSalary group by designation having count(*) >2;
- (viii) Select avg(benefits) from EmpSalary where designation ='Salesman';

6. (a) Verify the following using Boolean Laws: (2)
 $X'.Y + X.Y' = (X' + Y').(X + Y)$
- (b) Draw the equivalent logic circuit diagram of the following Boolean expression (2)
 $(A+B).(A+C').(B'+A'+C)$
- (c) Derive a Canonical Sum of Product expression for a Boolean function F, represented (1)
 by the following truth table :

X	Y	Z	F(X,Y,Z)
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

- (d) Reduce the following Boolean Expression using K Map: (3)
 $F(P,Q,R,S) = \pi (0,1,3,4,5,6,7, 9,10,11,13, 15)$
7. (a) What is a modem? (1)
- (b) Expand the following terms with respect to networking: (2)
 (i) SMS (ii) WLL (iii) HTML (iv) GPRS
- (c) Write one disadvantage of STAR topology over BUS topology. (1)
- (d) What is the difference between video conferencing and chat? (1)
- (e) Name any two examples of client side scripting language. (1)

- (f) Ideal IT Service Ltd is a software development organisation. It is planning to set up its Indian campus at Delhi with its head office at Mumbai. The Delhi campus has 4 main buildings PLANNING, ANALYSIS, DESIGN and IMPLEMENTATION. You as a network expert have to suggest the best network related solution for their problem raised in (i) to 9iv), keeping in the mind the distance between the building and other given parameter.



Shortest distance between various buildings:

PLANNING to IMPLEMENTATION	65m
PLANNING to DESIGN	100m
PLANNING to ANALYSIS	60m
IMPLEMENTATION to DESIGN	65m
IMPLEMENTATION to ANALYSIS	60m
ANALYSIS to DESIGN	55m
Mumbai HEAD OFFICE to Delhi CAMPUS	1725km

Number of computers installed at various buildings are as follows:

PLANNING	130
IMPLEMENTATION	85
DESIGN	50
ANALYSIS	22
Mumbai HEAD OFFICE	30

- (i) Suggest the most appropriate location of the server inside the Delhi campus (1) (out of the 4 buildings), to get best connectivity for maximum number of computer, justify your answer.
- (ii) Suggest and draw the cable layout to efficiently connect various buildings within (1) the Delhi campus for connecting the computers.
- (iii) Which hardware device will you suggest to be procured by the company to be (1) installed to protect and control the Internet uses within the campus?
- (iv) Which of the following communication media, will you suggest to be installed (1) for connecting their Delhi campus for very effective (High speed) communication?
 - (i) Telephone line
 - (ii) Optical fibre
 - (iii) Ethernet cable.

1. (a) What is the difference between local variable and global variable? Explain with suitable example. (2)

(b) Write the names of the header files needed for successful compilation and execution of the following code : (1)

```
void main()
{
    int Last=26.569;
    cout<<setw(8)<<Last;
}
```

(c) Rewrite the following C++ program after removing all the syntactical errors (if any), underlining each correction. (2)

```
#include[iostream.h]
class PAYITNOW
{
    int Charge;
    PUBLIC:
        void Raise( ) { cin>>Charge; }
        void Show { cout<<Charge; }
};
void main( )
{
    PAYITNOW P;
    P.Raise( );
    Show( );
}
```

(d) Find and write the output of the following C++ program code : (2)
Note: Assume all required header files are already included in the program.

```
void Reposition(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[ ]="SUCCEDED";
```

```

cout<<"Initial String:"<<STR;
Reposition(STR);
cout<<"\n New String:"<<STR;
}

```

- (e) Find and write the output of the following C++ program code : (3)

Note: Assume all required header files are already included in the program.

```

void ChangeArray(int number, int ARR[ ], int Size)
{
    for(int L=0; L<Size; L++)
    {
        if(L<number)
            ARR[L]+=L;
        else
            ARR[L]*=L;
    }
}

void Show(int ARR[ ], int Size)
{
    for(int L=0; L<Size; L++)
        (L%2==0)?cout<<ARR[L]<<"#" : cout<<ARR[L]<<endl;
}

void main( )
{
    int Array[ ]={30, 20, 40, 10, 60, 50};
    ChangeArray(3, Array, 6);
    Show(Array, 6);
}

```

- (f) Study the following program and select possible output(s) from the option (i) to (iv) (2) following it. Also find the maximum and the minimum values that can be assigned to the variable 'p'.

Note: Assume all required header files are already being included in the program. *random(n)* function generates integers between 0 and n-1.

```

void main( )
{
    randomize( );
    char colorname[ ][10]={"White", "Pink", "Red", "Orange"};
    int p;
    for(int a=0; a<=2; a++)
    {
        p=random(2)+1;
        cout<<colorname[p]<<":" ;
    }
}

```

Output

- (i) Pink:Red:Pink: (ii) White:Pink:Red:
 (iii) Pink:Red:Orange: (iv) Pink:Red:Red:

2. (a) What do you understand by Data encapsulation and Data hiding? Also, give a (2) suitable C++ code to illustrate both.

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

```
class employee
{
    int pay;
    char address[20];
public:
    employee(int y) { pay = y; }           //constructor 1
    employee(employee &t);                 //constructor 2
};
```

- i) Create an object, such that it invoke constructor 1.
ii) Write complete definition for constructor 2.

- (c) Define a class CLOTHING with the following description:- (4)

Private members:

- CCode of type string
- CType of type string
- CSize of type integer
- CFabric of type string
- CPrice of type float
- A function Assign() which calculates and assigns the value of CPrice as follows:

For CFabric as "COTTON"

CType	CPrice(Rs)
TROUSER	1500
SHIRT	1200

For Material other than "COTTON" the above mentioned CPrice gets reduced by 25%.

Public Members:

A constructor to assign initial values of CCode, CType and CFabric with the word "NOT ASSIGNED" and CSize and CPrice with 0.

A function Enter() to input the values of the data members CCode, CType, CSize and CFabric and invoke the Assign() function.

A function Show() which displays the content of all the data members for CLOTHING.

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

```
class LivingBeing
{
    char specification[20];
    int averageage;
public:
    void read( );
    void show( );
};
class Ape : private LivingBeing
{
    int no_of_organs, no_of_bones;
protected:
    int iq_level;
public:
    void readape( );
    void showape( );
};
```

```

class Human : public Ape
{
    char race[20];
    char habitation[30];
public:
    void readhuman( );
    void showhuman( );};

```

- (i) Name the members, which can be accessed from the member functions of class Human.
- (ii) Name the members, which can be accessed by an object of class Ape.
- (iii) Name the members, which can be accessed by an object of class Human.
- (iv) What will be the size of an object (in bytes) of class Human?

3. (a) Write the definition of a function `grace_score (int score [], int size)` in C++, which should check all the elements of the array and give an increase of 10 to those scores which are less than 50. **(3)**

Example: if an array of seven integers is as follows:

45, 35, 85, 80, 33, 27, 90

After executing the function, the array content should be changed as follows:

55, 50, 85, 80, 43, 37, 90

- (b) An array `A[50][100]` is stored along the row in the memory with each element occupying 2 bytes of storage. Find out the address of the element `A[20][50]`, if the location of element `A[10][25]` is stored at the address 10000. **(3)**
- (c) Write the definition of a member function `PUSH()` for a class `STACK` in C++ to insert a node containing student's information from a dynamically allocated stack of students considering the following code is already written as a part of the program (assume all necessary header files are included in program): **(4)**

```

struct Student
{
    int RNO;
    char Name[30];
    Student *Next;
};

```

```

class STACK
{
    Student *TOP;
public:
    STACK()
    {
        TOP=NULL;
    }
    void PUSH();
    void POP();
};

```

- (d) Write a function in C++ to print the sum of all the non-negative elements present on both the diagonal of a two dimensional array passed as the argument to the function. **(2)**

- (e) Evaluate the following POSTFIX expression. Show the status of Stack after execution of each operation separately: **(2)**
50, 40, +, 18, 14, -, 4, *, +
4. (a) Assuming that a text file named FIRST.TXT contains some text written into it, write a function named VowelWords(), that reads 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'). **(2)**

Example:

If the content of FIRST.TXT is:

```
Carry umbrella and overcoat when it rains.
```

Then, the file SECOND.TXT shall contain:

```
umbrella and overcoat it
```

- (b) Consider a binary file "CUSTOMER.DAT", containing objects of the following class: **(3)**

```
class CUSTOMER
{
    Int CId;           //Customer Id
    char CName[30];   //Customer Name
    char Category;    //Customer Type: 'G' for General 'N' for Not General
public:
    void Buy( );      //function to Buy goods
    void Display( );  //function to display details
    char GetCategory( )
    {
        return Category;
    }
};
```

Write a function in C++ to read and display the details of all the customers whose Category is 'G'.

- (c) Find the output of the following C++ code considering that the binary file STUDENT.DAT already exists on the hard disk with records 10 students. **(1)**

```
class student
{
    int admno;
    char name[20];
public:
    void getdata( )
    {
        cout<<" \nEnter the admission no: ";
        cin>>admno;
        cout<<" \nEnter name of the student: ";
        gets(name); }
    void showdata( )
    {
        cout<<" \n Admission No: " <<admno;
        cout<<" \n Name: ";
        puts (name);
    }
};
```

```

int retadmno() {
    return admno;
} };
void main()
{
    fstream SF;
    SF.open("STUDENT.DAT", ios::binary | ios::out | ios::app);
    student S;
    S.getdata();
    SF.write(char*)&S, sizeof(S);
    S.getdata();
    SF.write(char*)&S, sizeof(S);
    int LOC=SF.tellp()/sizeof(S);
    cout<<"Total records in file:"<<LOC;
    SF.close();
}

```

5. (a) Define degree and cardinality of a relation. What is the degree and cardinality of the given table. (2)

M_Id	M_Company	M_Name	M_Price	M_Mf_Date
MB001	Samsung	Galaxy	4500	2013-02-12
MB003	Nokia	N1100	2250	2011-04-15
MB004	Micromax	Unite3	4500	2016-10-17
MB005	Sony	XperiaM	7500	2017-11-20
MB006	Oppo	SelfieEx	8500	2010-08-21

- (b) Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables given below: (6)

Table: Employees

Empid	Firstname	Lastname	Address	City
010	Ravi	Kumar	Raj Nagar	GZB
105	Harry	Waltor	Gandhi Nagar	GZB
152	Sam	Tones	33 Elm St	Paris
215	Sarah	Ackerman	440 U.S. 110	Upton
244	Manila	Sengupta	24 Friends Street	New Delhi
300	Robert	Samuel	9 Fifth Cross	Washington
335	Ritu	Tondon	Shastri Nagar	GZB
400	Rachel	Lee	121 Harrison Street	New York
441	Peter	Thompson	11 Red Road	Paris

Table: EmpSalary

Empid	Salary	Benefits	Designation
010	75000	15000	Manager
105	65000	15000	Manager
152	80000	25000	Director
215	75000	12500	Manager
244	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman
441	28000	7500	Salesman

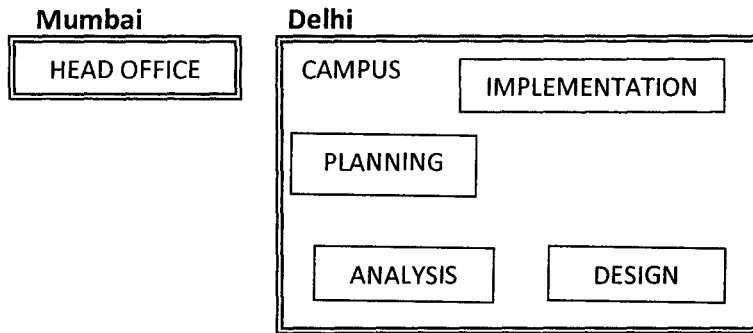
- (i) To display firstname, lastname, address and city of all employees living in Paris.
- (ii) To display the content of Employees table in descending order of Firstname.
- (iii) To display the firstname, lastname and total_salary of all managers from the tables Employee and EmpSalary , where total_salary is calculated as salary+benefits.
- (iv) To display the maximum salary among managers and Clerks from the table Empsalary.
- (v) Select firstname, salary from Employees ,EmpSalary where designation = 'Salesman' and Employees.Empid=Empsalary.Empid;
- (vi) Select count(distinct designation) from EmpSalary;
- (vii) Select designation, sum(salary) from EmpSalary group by designation having count(*) >2;
- (viii) Select sum(benefits) from EmpSalary where designation ='Clerk';

6. (a) Verify the following using Boolean Laws: (2)
 $a'+b = a'.b' + a'b + a.b$
- (b) Draw the equivalent logic circuit diagram of the following Boolean expression (2)
 $AB + AC' + B'A'C$
- (c) Derive a Canonical Product of Sum expression for a Boolean function F, represented by the following truth table : (1)

X	Y	Z	F(X,Y,Z)
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

- (d) Reduce the following Boolean Expression using K Map: (3)
 $F(P,Q,R,S) = \sum (0,1,3,4,5,6,7, 9,10,11,13, 15)$
7. (a) What is a hub? (1)
- (b) Expand the following terms with respect to networking: (2)
 (i) PPP (ii) GSM (iii) XML (iv) HTTP
- (c) Write one advantage of STAR topology over BUS topology. (1)
- (d) What is the difference between E-mail and chat? (1)
- (e) Name any two examples of server side scripting language. (1)

- (f) Ideal IT Service Ltd is a software development organisation. It is planning to set up its Indian campus at Delhi with its head office at Mumbai. The Delhi campus has 4 main buildings PLANNING, ANALYSIS, DESIGN and IMPLEMENTATION. You as a network expert have to suggest the best network related solution for their problem raised in (i) to 9iv), keeping in the mind the distance between the building and other given parameter.



Shortest distance between various buildings:

PLANNING to IMPLEMENTATION	65m
PLANNING to DESIGN	100m
PLANNING to ANALYSIS	60m
IMPLEMENTATION to DESIGN	65m
IMPLEMENTATION to ANALYSIS	60m
ANALYSIS to DESIGN	55m
Mumbai HEAD OFFICE to Delhi CAMPUS	1725km

Number of computers installed at various buildings are as follows:

PLANNING	130
IMPLEMENTATION	85
DESIGN	50
ANALYSIS	22
Mumbai HEAD OFFICE	30

- (i) Suggest the most appropriate location of the server inside the Delhi campus (out of the 4 buildings), to get best connectivity for maximum number of computer, justify your answer. **(1)**
- (ii) Suggest and draw the cable layout to efficiently connect various buildings within the Delhi campus for connecting the computers. **(1)**
- (iii) Which hardware device will you suggest to be procured by the company to be installed to protect and control the Internet uses within the campus? **(1)**
- (iv) Which of the following communication media, will you suggest to be installed for connecting their Delhi campus for very effective (High speed) communication? **(1)**
 - (i) Telephone line
 - (ii) Optical fibre
 - (iii) Ethernet cable.
