Series 3НКР3Б/С

SET~4

Code No. 491

Roll No.

Candidates must write the Code on the title page of the answer-book.

NOTE :

*(i) Please check that this question paper contains **21** printed pages.*

(ii) Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.

*(iii) Please check that this question paper contains **7** questions.*

*(iii) **Please write down the serial number of the question in the answer-book before attempting it.***

(iv) 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

COMPUTER SCIENCE (OLD)

Time allowed : 3 hours *Maximum Marks : 70*

General Instructions :

(i) *SECTION A refers to programming language C++.*

(ii) *SECTION B refers to programming language Python.*

(iii) *SECTION C is compulsory for all.*

(iv) *Answer either SECTION A or SECTION B.*

(v) *It is compulsory to mention on page 1 in the answer-book whether you are attempting SECTION A or SECTION B.*

(vi) ***All*** *questions are compulsory within each section.*

(vii) *Questions 2(b), 2(d), 3 and 4 have internal choices.*

SECTION A
[Only for candidates who opted for C++]

1. (a) Write the type of C++ Operators (Arithmetic, Relational or Logical Operators) from the following : *2*

(i) ||

(ii) <=

(iii) %

(iv) *

(b) Write the names of the correct header files, which must be included in the following C++ code to compile the code successfully : *1*

```
void main()
{
    char STR[]="india2020";
    STR[0]=toupper(STR[0]);
    puts(STR);
}
```

(c) Rewrite the following C++ program after removing any/all syntactical errors with each correction underlined : *2*

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

```
Typedef float REAL;
void main()
{
    REAL Pie=3.1416,R,AREA;
    cin<<R;
    AREA=Pie*R*R;
    cout>>'Area:'>>AREA>>endl;
}
```

(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 Manip(char S[])
{
   for(int I=0;S[I]!='\0'; I++)
      if (I%2 == 0)
        if (S[I]>='A' && S[I]<='M')
          S[I]=tolower(S[I]);
        else
          S[I]='#';
      else
        if (S[I]>='N' && S[I]<='Z')
          S[I]='*';
        else
          S[I]=S[I]+1;
}
void main()
{
   char TXT[]="CaNW2GeT";
   Manip(TXT);
   cout<<TXT<<endl;
}
```

(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 Exchange (int &A, int B=2)
{
    A+=B;
    B=A-B;
    cout<<2*A<<"@"<<4*B<<endl;
}
void main()
{
    int P=100, Q=50;
    Exchange(Q);
    Exchange(P,Q);
    Exchange(P);
}
```

(f) Look at the following C++ code and find which output(s) from the options (i) to (iv) is/are not possible. Also, write the minimum and maximum values that can possibly be assigned to the variable Val. *2*

Note :

- Assume all the required header files are already being included in the code.
- The function random(N) generates any possible integer between 0 and N-1 (both values included).

```
void main()
{
  randomize();
  int A[4],Val;

  for(int I=3; I>=0; I--)
  {
     Val = random(2+I) + 11;
     A[I]=Val;
  }
  for (I=0;I<4;I++)
     cout<<A[I]<<"@";
}
```

(i) 12@11@11@14@	(ii) 10@13@14@13@
(iii) 12@11@13@14@	(iv) 11@13@12@13@

2. (a) Given the following class Packer and assuming all necessary header file(s) included, answer the questions that follow the code:

```
class Packer
{
    int PID; float WT;
public:
    Packer(int ID)                  //Function 1
    {
         PID = ID;
    }
    Packer()                        //Function 2
    {
         PID = 1001;
         WT = 100;
    }
    Packer(Packer &P)               //Function 3
    {
         PID = P.PID + 1;
         WT = P.WT + 10;
    }
    Packer(float W)                 //Function 4
    {
         WT = W;
    }
    Packer(int ID, float W)         //Function 5
    {
         PID = ID;
         WT = W;
    }
};
void main()
{
    Packer P1;              //Statement I
    Packer P2(70);          //Statement II
    __________;             //Statement III
}
```

(i) Which function out of 1, 2, 3, 4 and 5 is a Copy Constructor and which one is a default constructor in the definition of class Packer ? *1*

(ii) Write the Statement III, to declare an object P3 of class Packer with two parameters 75 and 32.5. *1*

(b) Observe the following C++ code and answer the questions (i) and (ii).

Note : Assume all necessary files are included.

```
class Store
{
    int SID;
public:
    Store(int ID=10)              //Function 1
    {
        SID=ID;
        cout<<"Store"<<SID<<"Opened"<<end1;
    }
    ~Store()                      //Function 2
    {
        cout<<"Store Closed"<<end1;
    }
    void Display()                //Function 3
    {
        cout<<"Store "<<SID<<" is Active"<<end1;
    }
};
void main()
{
    Store S(25);
    S.Display();
}
```

(i) What is the output of the above code, on execution ? *1*

(ii) For the class Store, what is **Function 2** known as ? When does this function get executed ? *1*

OR

Explain Copy Constructor in context of Object Oriented Programming. Also give a supporting example in C++. *2*

(c) Write the definition of a class ACCESSORY in C++ with the following description : *4*

Private Members

- `ANO` `// integer`
- `TYPE` `// char array of size 20`
- `SECTION` `// char`
- `SECASSIGN()` `/* Member function to assign value of SECTION based upon TYPE as follows : */`

TYPE	SECTION
MOBILE	A
COMPUTER	B
CAMERA	C
FASHION	D

Public Members

- `GetOne()` `/* Function to allow user to enter values of ANO and TYPE then invoke SECASSIGN() to assign SECTION */`
- `ShowOne()` `/* Function to display values of ANO, TYPE and SECTION */`

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

```
class GM
{
    int MID;
protected:
    double Sal;
    void Calc();
public:
    void Enter();
    void Display();
};

class DIRECTOR
{
    int DID;
protected:
    double Fees;
public:
    void Enter(); void Display();
};

class STORE: private DIRECTOR, public GM
{
    int STID;
public:
    void Enter(); void Display();
};
void main()
{
    STORE ST;
    _____; //Statement
}
```

(i) Which type of Inheritance out of the following is illustrated in the above example ?

– **Single Level Inheritance, Multilevel Inheritance, Multiple Inheritance**

(ii) Write the names of **all the data members**, which are directly accessible by the member function **Display()** of class **STORE**.

(iii) Write the names of **all the member functions**, which are directly accessible by the object ST of class **STORE** in main().

(iv) Write the statement to call and execute Display() function of class GM by the object ST declared in the **main()** function.

OR

(d) Consider the following class Company :

```
class COMPANY
{
    int CCODE;
    char DES[20];
protected:
    char LOCATION[40];
public:
    void Register(){cin>>CCODE;gets(DES);gets(LOCATION);}
    void Show(){cout<<CCODE<<DES<<CITY<<endl;}
};
```

Write a code in C++ to privately derive another class TRADER from the base class COMPANY with the following members. *4*

Data Members (private)

- STATE of type string
- TARGET of type float

Member Functions (public)

- A constructor function to assign STATE as "SOMESTATE" and TARGET as 1000.
- TraderReg() to allow user to enter STATE and TARGET, also call Register() of COMPANY.
- ShowTrade() to display STATE and TARGET.

3. (a) Write the definition of a function **`SWAPPER(int M[], int N)`** in C++, which should **`SWAP`** alternate elements of the array **`M[]`** containing **`N`** number of integers, where **`N`** is an even integer. The function should also display the swapped content of the array. *3*

Example : If the array **`M`** contains

0	1	2	3	4	5	6	7
18	13	12	17	16	21	14	15

Then the function should display the output as follows :

```
13
18
17
12
21
16
15
14
```

OR

(a) Write the definition of a function **FourQtr(int A[], int N)** in C++, which should display the sum of four quarters of the array **A[]** containing **N** number of integers, where **N** is an even integer. *3*

Example : If the array **A** contains the following elements for **N=8**

0	1	2	3	4	5	6	7
70	30	20	10	60	50	5	7

Then the function should display

```
100
30
110
12
```

(b) Write the definition for a function **TOPDIAG(int T[4][4])** in C++, which displays the portion content of the 2D array as displayed in the example below. *2*

For example :

ARRAY T			
12	14	16	18
10	11	13	15
22	24	26	28
20	21	23	25

CONTENT TO BE DISPLAYED
12 14 16 18
10 11 13
22 24
20

OR

(b) Write the definition for a function **DiagSum(int P[4][4])** in C++, which finds and displays the sum of values on both the diagonal elements separately. *2*

For example :

ARRAY P			
20	15	25	50
35	30	40	15
55	50	60	45
70	75	85	80

OUTPUT
Sum of Diagonal 1:190
Sum of Diagonal 2:210

(c) Let us assume S[15][25] is a two-dimensional array, which is stored in the memory along the column with each of its element occupying 4 bytes, find the address of the element S[5][15], if the address of the element S[2][5] is 15000. *3*

OR

(c) If K[2...10][-2...20] is a two-dimensional array, which is stored in the memory along the row with a base address as 52000 and each of its element occupying 2 bytes, find the address of the element K[5][10]. *3*

(d) Write the definition of a function

`QInsert(float Q[], int &R, int F),`

which inserts a value in a circular static queue Q[ ] (here, consider parameters R as rear end of the queue and F as front end of the Queue). Also, check for a condition if the queue is full or not before performing insertion, the function should display a message "Queue is FULL" when the Queue is full. *4*

OR

(d) For the following structure of ITEM in C++

```
struct ITEM
{
    int     ID;
    char   Qty;
    ITEM *Next;
};
```

Given that the following declaration of class ITEMQUEUE in C++, which is representing a dynamic queue of ITEM (as per the structure ITEM declared above) :

```
class ITEMQUEUE
{
    ITEM *R, *F; //Pointers with addresses of Rear and Front
public:
    ITEMQUEUE()
    {
       R=NULL; F=NULL;
    }
    //A Function to insert an Item in the dynamic queue
    void QINSERT();
    //A Function to delete an Item from the dynamic queue
    void QDELETE();
    ~ITEMQUEUE();
};
```

Write the definition for the member function `void ITEMQUEUE::QINSERT()`, that will insert an item into the dynamic queue of `ITEMQUEUE` (take necessary input from user). *4*

(e) Evaluate the following Postfix expression, showing the stack contents : *2*

`350,5,/,19,2,*,20,-,-`

OR

(e) Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion : *2*

`U - V / W * R + T`

4. (a) A text file named **PRAYER.TXT** contains some text. Write a function definition **GODLINES()** in C++ that would read each line of **PRAYER.TXT** and display those lines, which are starting with **GOD**. *3*

OR

(a) A text file named **NOTES.TXT** contains some text. Write the function definition **DISPLAY2()** in C++ which displays first 2 letters of each word of the text file.
For example : If the file **NOTES.TXT** contains : *3*

PYTHON IS ONE LANGUAGE AND C++ IS ANOTHER LANGUAGE

Then the function should display the output as :

PY IS ON LA AN C+ IS AN LA

(b) Write a definition for function **NORTHTRADE()** in C++ to read each object of a binary file **TRADER.DAT**, find and display the Total amount of of trade done by traders from NORTH region.
Assume that the file **TRADER.DAT** is created with the help of objects of **class Trader**, which is defined below : *2*

```
class Trader
{
    int Code;char Region[20]; float Amount;
public:
    void RegTrader();
    void ShowTrader();
    float GetAmount()  { return Amount; }
    char* GetRegion()  { return Region; }
};
```

OR

(b) A binary file **SWEETS.DAT** contains records stored as objects of the following class : *2*

```
class Sweet
{
    int SCode; char Sweet[20]; int Qty;
public:
    int GetSCode(){ return Scode; }
    int GetQty(){ return Qty; }
    void Show()
    { cout<<SCode<<" : "<<Sweet<<" : <<Qty<<endl;
    };
```

Write definition for function **ShowHigh()** in C++, whch displays the details of those sweets from the file **SWEETS.DAT**, whose **Qty** is more than 1000.

(c) Find the output of the following C++ code considering that the binary file CHANNEL.DAT exists on the hard disk with the following 6 records for the class CHANNEL containing CNAME and TO (TURNOVER in Crore). *1*

CNAME	TURNOVER
KIDIES	11
NEWSFAST	60
QUICKNEWS	20
CARTOONX	45
GAMEZ	50
MOVIETRACKER	62

```
class CHANNEL
{
  char CNAME[20];int TO;
public;
  void GetC();
  void ShowC()
  { cout<<CNAME<<":"
        <<TO<<endl;}
};
```

```
void main()
{ fstream F;
  F.open("CHANNEL.DAT",ios::binary|ios::in);
  CHANNEL C;
  F.seekg(3*sizeof(C));
  F.read((char*)&C, sizeof(C));
  F.read((char*)&C, sizeof(C));
  C.ShowC();
  F.close();
}
```

OR

(c) Differentiate between seekp() and tellp(). Give a suitable example to illustrate the difference. *1*

SECTION B

[Only for candidates, who opted for Python]

1. (a) What is the difference between logical error and run-time error ? Give a suitable example of each. *2*

(b) Name the Python Library modules which need to be imported to invoke the following functions : *1*

(i) `factorial()`

(ii) `group()`

(c) Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code. *2*

```
Val = 32
for K in range(20:32):
  if K>25
     print K*Val
  Else:
     PRINT K+ValNumber
```

(d) Find and write the output of the following Python code : *2*

```
Txt="Some2Thing"
STxt=""
Fold=0
for C in range(0,len(Txt)):
    if Txt[C]>="0" and Txt[C]<="9":
      Fold=1
      STxt = STxt + "#"
   elif Fold==0 and Txt[C]>="A" and Txt[C]<="S":
      STxt = STxt + "@"
   elif Fold==1 and Txt[C]>="T" and Txt[C]<="Z":
      STxt = STxt + "*"
   else:
      STxt = STxt + Txt[C]
print STxt
```

(e) Find and write the output of the following Python code : *3*

```
def Compute(A,B,C="*"):
   for I in range(A,B+1):
   if I%2==0:
      print I,C,
   else:
      print I,"@",
   print " "
Compute(10,14)
Compute(25,29,"#")
Compute(5,10)
```

(f) Out of the (i) to (iv) options, which is/are not possible outputs(s) of the following program code ? Also specify the maximum value that can be assigned to the variable R. *2*

```
import random
ALPHA=["A","C","E","F","G","B"]
fOR I in range(1,4):
  R=random.randint(I,5)
  print ALPHA[R],":",
```

(i) **F : B : F :**	(ii) **C : G : F :**
(iii) **A : G : F :**	(iv) **G : B : G :**

2. (a) Explain the concept of Polymorphism in Python. Write suitable example to illustrate the concept of Polymorphrism. *2*

(b)

```
class SHOP:                                  #Line 1
     NUM = 100                               #Line 2
     CATEG="GEN.STORE"                       #Line 3
     def __init__(self,C,N=25):              #Line 4
          self.NUM = N                       #Line 5
          self.CATEG = C                     #Line 6
     def SHOW(self):                         #Line 7
          print self.NUM,self.CATEG          #Line 8
          print SHOP.CATEG,SHOP.NUM          #Line 9
S1=SHOP("TOYS")                              #Line 10
S1.SHOW()                                    #Line 11
S2=SHOP("FURNITURE",105)                     #Line 12
SHOP.CATEG="GAMES"                           #Line 13
S2.SHOW()                                    #Line 14
```

Write the output of the above Python code. *2*

OR

(b)
```
class Flat:                                    #Line 1
     def __init__(self):                       #Line 2
         self.No = 100                         #Line 3
         self.Floor = 2                        #Line 4
     def __del__(self):                        #Line 5
         print "Sold Out"                      #Line 6
     def VIEW(self):                           #Line 7
         print self.No,self.Floor              #Line 8
def Buy():                                     #Line 9
  F=Flat()                                     #Line 10
  F.VIEW()                                     #Line 11
Buy()                                          #Line 12
```

(i) Which statement (Line number) out of Line 1 to Line 8 will be called and get executed first, when statement at Line 10 gets executed ? Justify your answer.

(ii) What will be the output of the above code ?

(c) Define a class CLUB in Python with following specifications : *4*

Instance Attributes

- **ID** # Member Number
- **Mname** # Member Name
- **Activity** # Activity
- **Fee** # Membership Fee

Methods/function

- **GetFee()** # To assign Fee
  # as per Activity chosen by member as follows :

Activity	Fee
Badminton	1500
Table Tennis	1200
Football	600
Gym	2500

- **Register()** # To allow user to enter value of
  # ID, Mname and Activity.
  # The function should also
  # call GetFee() to assign Fee
- **View()** # To display ID, Mname, Activity and Fee

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

```
class Manager(object):                                  #Line 1
    def __init__(self,SAL):                             #Line 2
        self.MSAL = SAL
    def LevelNext(self,S):                              #Line 3
        self.MSAL =self.MSAL+S
    def MView(self):                                    #Line 4
        print self.MSAL

    class Consultant(object):                           #Line 5
    def __init__(self,FEE):                             #Line 6
        self.CTEE=FEE
    def Hike(self,F):                                   #Line 7
        self.FEE =self.FEE + F
    def CView(self):                                    #Line 8
        print self.FEE
class Company(Manager,Consultant):                      #Line 9
    def __init__(self,BGT):                             #Line 10
        self.CBGT=BGT
        Manager.__init__(self,BGT/5)                    #Line 11
        Consultant.__init__(self,BGT/10)                #Line 12
    def Uplift(self,A):                                 #Line 13
        self.BGT=self.BGT+A
        Manager.LevelNext(self,A/4)
        Consultant.Hike(self,A/2)

    def CMView(self):                                   #Line 14
        print self.BGT,
        Manager.MView(self)
        Consultant.CView(self)
CM=Company(12000000)                                    #Line 15
CM.UpLift(20000)
CM.CMView()
```

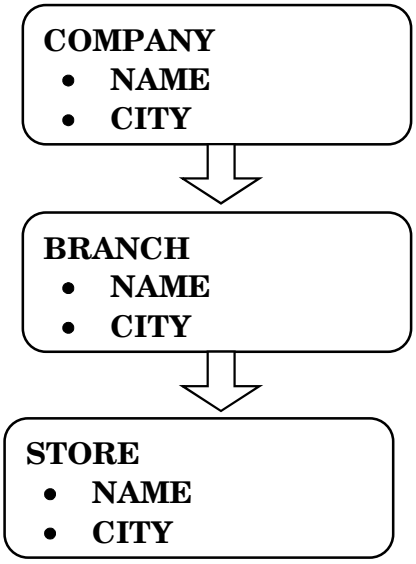
(i) Write the type of the inheritance illustrated in the above. *1*

(ii) Which statements (line numbers) in the above program code will call and execute statements written at Line 2 and Line 6 ? *2*

(iii) Find and write the output of the above code. *1*

OR

(d) Write a Python code to illustrate example of inheritance depicting the following information. *4*



3. (a) Consider the following randomly ordered numbers stored in a list :

```
16, 14, 18, 12, 15, 11
```

Show the content of list after the First, Second and Third pass of the bubble sort method used for arranging in **descending order ?** *3*

Note : Show the status of all the elements after each pass very clearly encircling the changes.

OR

(a) Consider the following randomly ordered numbers stored in a list :

```
16, 14, 16, 12, 15, 17
```

Show the content of the list after the First, Second and Third pass of the selection sort method used for arranging in **ascending order**. *3*

Note : Show the status of all the elements after each pass very clearly encircling the changes.

(b) Write definition of a method/function `TenSum(SCORES)` to find and display sum of those scores which are less than 500 and ending with 0. *3*

For example,

If the SCORES contain `[150,206,370,110,920,530,501,120]`

The function should display

```
Ten Sum: 640
```

OR

(b) Write definition of a method/function `NotLess(PRICE, LowPrice)` to count and display number of values of PRICE, which are not less than LowPrice. *3*

For Example :

If the PRICE contains `[100,120,103,180,162,113]` and LowPrice contains `115`

The function should display

```
3 Prices are not less than 115
```

(c) Write **QueueIn(ITEM)** and **QueueDel(ITEM)** methods/function in Python to add a new **ITEM** and delete an **ITEM** from a list **ITEM** containing item names, considering them to act as insert and delete operations of the Queue data structure. *4*

OR

(c) Write **PushBox(BOX)** and **PopBox(BOX)** methods/function in Python to add a new **BOX** and delete a **BOX** from a List of **BOX** of fruits, considering them to act as push and pop operations of the Stack data structure. *4*

(d) Write a Python method/function **SWapPair(COLORS)** to swap the alternate values of the content of a list **COLORS** and display the final values of **COLORS**. *2*

Note : Assuming that the list has even number of values in it.

For Example :

If the list **COLORS** contains

```
["RED","BLACK","WHITE","PINK", "CYAN","BLUE"]
```

After swap pair operation the content should be displayed as

```
BLACK RED PINK WHITE BLUE CYAN
```

OR

(d) Write a Python method/function **DispFactors(N)** to find and display all the factors of an integer N (parameter). *2*

For Example :

If the value of N is **28**

The output should be displayed as

```
1 2 4 7 14 28
```

(e) Evaluate the following Postfix expression, showing the stack contents : *2*

```
65,5,/,40,+,9,5,*,-
```

OR

(e) Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion : *2*

```
U * V + W / (X - Y)
```

4. (a) Write a statement in Python to open a text file **MEETUP.TXT** so that existing content can be read from it. *1*

OR

(a) Write a statement in Python to open a text file **NOTICES.TXT** so that new contents can be written in it. *1*

(b) Write a method/function **FIRSTTWO()** in Python to read contents from a text file **PRAY.TXT**, to find and display the first two characters of every word of the file. *2*

For example :

If the content of the file is

```
WE LOVE OUR COUNTRY AND WE PRAY WELL BEING OF ALL
```

The method/function should display

```
WE LO OU CO AN WE PR WE BE OF AL
```

OR

(b) Write a method/function **APCount()** in Python to read and display the count of those lines from a text file **STATES.TXT**, which are starting either with **M** or starting with **P**. *2*

For example :

If the content of the file is

```
MIZORAM IS IN THE NORTH EAST OF INDIA
PUNJAB IS PROSPEROUS LAND
KERALA IS MOST LITERATE STATE
MUMBAI IS FILM CITY
MANIPUR IS FAMOUS FOR LOKTAK LAKE
```

The method should display

```
4
```

(c) Considering the following definition of class **TRADING**, write a method/function **SOUTHTRADE()** in Python to find and display the total amount of trade happened in SOUTH region from a pickled file **TRADING.DAT** containing records of **TRADING**. *3*

```
class TRADING:
    def __init__(self,R,A):
        self.Region=R
        self.Amount=A
    def Display(self):
        print self.Region,"#", self.Amount
```

OR

(c) Considering the following definition of class **GAMER**, write a method/function **GAMING()** in Python to search and display all the content from a pickled file **GAMER.DAT** where Type of **GAMER** is **"MOBILE"**. *3*

```
class GAMER:
    def __init__(self,I,T):
        self.ID=I
        self.TYPE=T    # PC,CONSOLE, MOBILE, INTERNET
    def Show(self):
        print self.ID,"#", self.TYPE
```

SECTION C

[For all candidates]

5. (a) Observe the following table FOOD carefully and answer the questions that follow : *2*

TABLE : FOOD

AVGPRICE	FNAME	FNO	ORIGIN
75	DOSA	F01	SOUTH INDIA
100	BURGER	F03	AMERICAN
45	VADA PAV	F04	MAHARASHTRA
70	CHOW MEIN	F09	CHINA
70	CHOLE BHATURE	F15	PUNJAB
80	SARSON KA SAAG	F12	RAJASTHAN
25	MAKKI KI ROTI	F11	RAJASTHAN

(i) What is the Degree and Cardinality of table FOOD ?

(ii) Which attribute out of AVGPRICE, FNAME, FNO and ORIGIN of table FOOD is the ideal one for being considered as the Primary Key and why ?

(b) Write SQL queries for (i) to (iv) and write outputs for SQL queries (v) to (viii), which are based on the following tables : *6*

TABLE : FURNITURE

FNO	FNAME	MATERIAL	QTY	SUPID
F01	CLASSIC BED	WOOD	12	S01
F02	SOFT SOFA	LEATHER	50	S05
F03	SHAHI BED	METAL	5	S06
F09	TERRACE CHAIR	PLASTIC	120	S04
F12	CLASSIC CHAIR	WOOD	300	S02
F11	DINING TABLE	WOOD	45	S01
F23	SIDE TABLE	GLASS	200	S02
F15	DINING CHAIR	WOOD	300	S01
F19	RELAXER	LEATHER	50	S05
F04	BUSINESS CHAIR	METAL	450	S06

TABLE : SUPPLIER

SUPID	SNAME	TURNOVER	CONTACT
S01	WOOD FINISHERS	5600000	P K MANTRA
S02	SHINE N CUT	12000000	F SAHOO
S04	PLASTINA TECH	32000000	T CHANDRA
S05	SOFTELIA	56000000	S JOHN
S06	SOLID METALS	45000000	P C KATKAR

(i) To display details of all the furniture from table FURNITURE, which are either GLASS or LEATHER material.

(ii) To display the FNO, FNAME, QTY of those furnitures from table FURNITURE, whose QTY is more than 100.

(iii) To count number of suppliers from table SUPPLIER, whose TURNOVER is more than 25000000.

(iv) To display details of all furniture from table FURNITURE in descending order of FNO.

(v)
```
SELECT MAX(TURNOVER), MIN(TURNOVER) FROM SUPPLIER;
```

(vi)
```
SELECT SUM(QTY), MATERIAL FROM FURNITURE
GROUP BY MATERIAL HAVING COUNT(*)>2;
```

(vii)
```
SELECT DISTINCT MATERIAL FROM FURNITURE;
```

(viii)
```
SELECT FNAME, SNAME FROM FURNITURE F, SUPPLIER S
WHERE F.SUPID = S.SUPID AND QTY=300;
```

6. (a) State any one De Morgan's Law of Boolean Algebra and verify it using truth table. *2*

(b) Draw the Logic Circuit of the following Boolean Expression : *2*

$A'.(B' + C) + D'$

(c) Derive a Canonical POS expression for a Boolean function F, represented by the following truth table : *1*

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

(d) Reduce the following Boolean Expression to its simplest form using K-Map : *3*

$F(U,V,W,Z) = \sum(0,2,4,5,8,10,11,13,14,15)$

7. (a) Ms. Taruna Gehlot copied a file from her friend's PEN DRIVE on to her Laptop and when she opened the file, her Laptop functions slowed down and other applications on the Laptop stopped working properly. Specifically, which of the following could have infected her Laptop files and Operating System out of the following ? Also, mention, what she should do to remove this infection from her Laptop ? *2*

(i) Spam Email

(ii) Worm

(iii) Virus

(iv) Trojan House

(b) Mr. Priyaver Desai was travelling from Mumbai to Delhi for his vacation along with his brand new Laptop (with no data and software installed in it) and one brand new portable hard drive. These items, he had bought for gifting to his nephew in Delhi. While travelling in the train, a co-traveller ran away with both these items. Do you think Mr. Desai should report this as a Cyber Crime or any other crime ? Write the reason for your answer. *1*

(c) Give two differences between Video Conferencing and Text Chat service. *1*

(d) Write the expanded names for the following abbreviated terms used in Networking and Communications : *2*

(i) SMTP

(ii) GSM

(iii) TCP

(iv) PPP

(e) Case Study Based Question

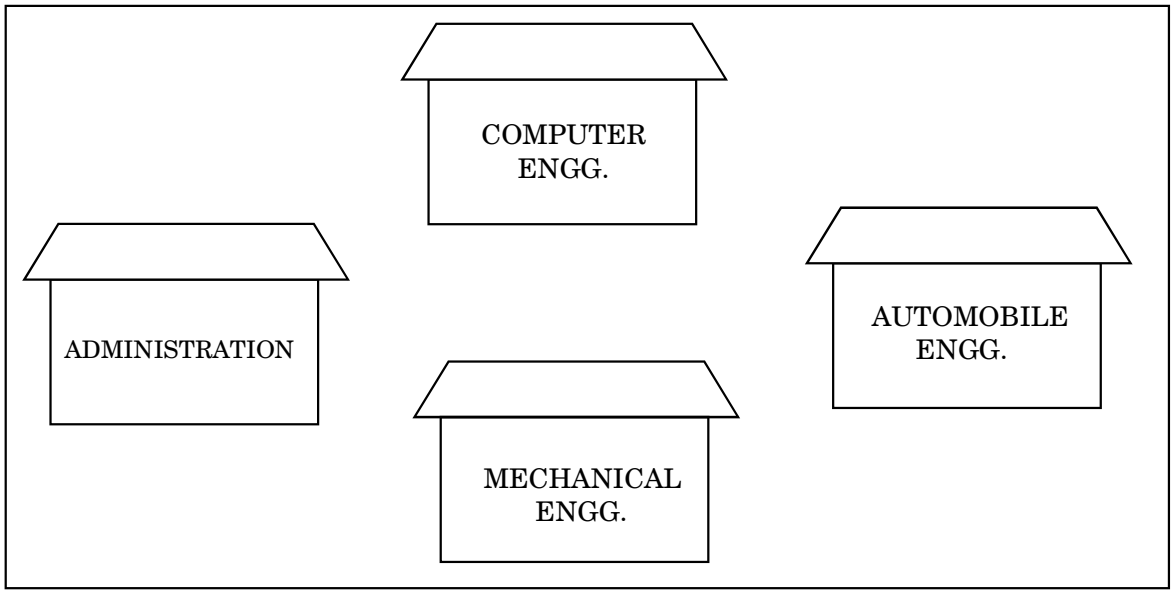
Global Knowledge Share Institute is planning to set up its centre in Hyderabad with four specialised blocks for Computer Engineering, Mechanical Engineering, Automobile Engineering along with Administration blocks in four separate buildings. The physical distances between these blocks and the number of computers to be installed in these blocks are given below. You as a network expert have to answer the queries (i) to (iv) as raised by the financial advisers of the institution.

Shortest distances between various locations in metres are as follows :

Computer Engg. to Mechanical Engg. Blocks	60
Computer Engg. to Automobile Engg. Blocks	40
Computer Engg. to Administration Blocks	60
Automobile Engg. to Mechanical Engg. Blocks	50
Automobile Engg. to Administration Blocks	110
Mechanical Engg. to Administration Blocks	40

Number of computers installed at various locations are as follows :

Administration Block	20
Computer Engg. Block	170
Mechanical Engg. Block	50
Automobile Engg. Block	40



(i) Suggest the most suitable location to install the main server of Global Knowledge Share Institute to get efficient connectivity with all the blocks. *1*

(ii) Suggest with the help of a drawing the best cable layout for effective network connectivity between all the blocks. *1*

(iii) Out of the following, suggest the most suitable device to be installed in each of these blocks for connecting all the computers installed within the centre : *1*

- Modem, Switch, Gateway, Router

(iv) Out of the following, suggest the most suitable wired medium for efficiently connecting the blocks : *1*

Network Cable: Optical Fiber, Ethernet Cable, Co-axial Cable, Single Pair Telephone Cable.

Also, mention which Topology of network, will be formed by connecting all the computer systems within each centre :

- Bus Topology or Star Topology