DELHI PUBLIC SCHOOL, DURGAPUR
QUESTION BANK OF COMPUTER SCIENCE
FOR BLOCK TEST-I EXAMINATION (2018-19)
CLASS-XII

Chapter 1

C++ REVISION TOUR

1. Write the type of C++ tokens (keywords and user defined identifiers) from the following:
   (i) new (ii) While (iii) case (iv) Num_2 [2]
2. Anil typed the following C++ code and during compilation he found three errors as follows:

   (i) Function strlen should have prototype (ii) Undefined symbol cout

   (iii) Undefined symbol endl

On asking, his teacher told him to include necessary header files in the code. Write the names of the header files, which Anil needs to include, for successful compilation and execution of the following code: [2]

```
void main( )
{
        char Txt [ ] = "Welcome";
        for (int C= 0; C<strlen(Txt); C++)
                Txt[C] = Txt[C]+1;
        cout<<Txt<<endl;
}
```

3. Rewrite the following C++ code after removing any/all syntactical errors with each correction underlined. [2]

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

```
void main ( )
{
        cout<<"Enter an Alphabet:"; cin>>CH;
        switch(CH)
        case „A‟ cout<<"Ant"; Break; case „B‟ cout<<"Bear" ; Break;
}
```

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

```
#define Diff(N1,N2) ((N1>N2)?N1-N2:N2-N1)
void main ( )
{
        int A,B, NUM[] = {10,23,14,54,32};
        for (int CNT =4; CNT>0; CNT--)
```

```
        {
            A=NUM[CNT];
            B=NUM[CNT-1];
            cout<<Diff(A,B)<<'#';
        }

    }
```

5. Find and write the output of the following C++ program code: [3]

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

```
void main ( )
{
    int *Point, Score [ ]={100,95,150,75,65,120};
    Point = Score;
    for (int L = 0; L<6; L++)
    {
        if ((*Point)%10==0)
            *Point /= 2;
        else
            *Point -= 2;
        if ((*Point)%5==0)
            *Point /= 5;
        Point++;
    }
    for(int L = 5; L>=0; L--)
        cout<<Score[L]<<"*";
}
```

6. Look at the following C++ code and find the possible output(s) from the options (i) to (iv) following it. Also, write the maximum values that can be assigned to each of the variables N and M. [2]

Note :

- Assume all the required header files are already being included in the code.
- The function random(n) generates an integer between 0 and n – 1.

```
void main ( )
{
    randomize ( );
    int N=random(3),M=random(4);
    int DOCK[3][3] = {{1,2,3},{2,3,4},{3,4,5}};
```

```
for(int R=0; R<N; R++)
{
        for (int C=0; C<M; C++)
                cout<<DOCK[R][C]<<" ";
        cout<<endl;
}
}
```

i.1 2 3
2 3 4
3 4 5

ii. 1 2 3
2 3 4

iii. 1 2
2 3

iv. 1 2
2 3
3 4

7. Look at the following C++ code and find the possible output(s) from the options (i) to (iv) following it. Also, write the highest and lowest values that can be assigned in the array A. [2]

Note :

- Assume all the required header files are already being included in the code.
- The function random(n) generates an integer between 0 and n – 1.

```
void main()
{
        randomize();
        int A[4], C;
        for(C=0; C<4; C++)
                A[C]=random(C+1)+10;
        for(C=3; C>=0; C--)
                cout<<A[C]<<"@";
}
```

i.	ii.
13@10@11@10@	15 14 12 10
iii.	iv.
12@11@13@10@	12@11@10@10@

8. Observe the following program very carefully and write the names of those header file(s), which are essentially needed to compile and execute the following program successfully : [**1**]

```
typedef char TEXT[80];
void main()
{
        TEXT Str[] = "Peace is supreme";
        int Index=0;
        while (Str[Index]!='\0')
                if (isupper(Str[Index]))
                        Str[Index++]='#';
                else
                        Str[Index++]='*';
        puts(Str);
```

}

(i) Observe the following C++ code very carefully and rewrite it after removing any/all syntactical errors with each correction underlined. **[2]**

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

```
#Define float Max=70.0;
Void main()
{
int Speed
char Stop='N';
cin>>Speed;
if Speed>Max
Stop='Y';
cout<<Stop<<end;
}
```

(d) Write the output of the following C++ program code : **[2]**

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

```
void Position(int &C1,int C2=3)
{
    C1+=2;
    C2+=Y;
}
void main()
{
    int P1=20, P2=4;
    Position(P1);
    cout<<P1<<","<<P2<<end1;
    Position(P2,P1);
    cout<<P1<<","<<P2<<end1;
}
```

9. Study the following program and select the possible output(s) from the options (i) to (iv) following it. Also, write the maximum and the minimum values that can be assigned to the variable NUM. [2]

Note :

–Assume all required header files are already being included in the program.

–random(n) function generates an integer between 0 and n – 1.

```
void main()
{
    randomize();
    int NUM;
    NUM=random(3)+2;
    char TEXT[]="ABCDEFGHIJK";
    for (int I=1;I<=NUM; I++)
    {
        for(int J=NUM; J<=7;J++)
```

```
            cout<<TEXT[J];
        cout<<end1;
    }
}
```

i.
FGHI
FGHI
FGHI
FGHI

ii.
BCDEFGH
BCDEFGH

iii.
EFGH
EFGH
EFGH
EFGH

iv.
CDEFGH
CDEFGH

Chapter 2

OBJECT ORIENTED PROGRAMMING

1. What do you mean by Abstraction and Encapsulation? How are these two terms are related? [2]
2. Enlist few advantages of OOPs. [2]
3. Difference between OOP and Procedural Programming. [2]
4. What do you mean by polymorphism? Given an example in C++ to show its implementation in C++. [2]

Chapter 3

FUNCTION OVERLOADING

1. Illustrate the concept of Function overloading with the help of an example. [2]
2. A function printchar is defined as:- [2]

```
void printchar(char c='*', int len=40)
{
        for(int x=0;x<len;x++) cout<<ch;
        cout<<endl;
}
```

   i. To print '*' 40 times
   ii) to print '*' 20 times
   iii) to print '=' 40 times
   iv) to print '=' 30 times
3. Write the prototype for a set of overloaded functions called **multiply()** that performs multiplication complex numbers and complex numbers returning complex numbers **and** between complex numbers and floating-point numbers returning complex numbers **and** between floating-point numbers returning floating point number.
4. Program of function overloading. [4]

5. Which function(s) out of the following can be considered as overloaded function(s) in the same program ? Also, write the reason for not considering the other(s) as overloaded function(s). [2]

```
void Execute(char A,int B); // Function 1
void Execute(int A,char B); // Function 2
void Execute(int P=10); // Function 3
void Execute(); // Function 4
int Execute(int A); // Function 5
void Execute(int &K); // Function 6
```

Chapter 4

CLASS AND OBJECTS

1. How does a class enforce data-hiding, abstraction and encapsulation? [2]
2. How class and objects are different in OO programming? [2]
3. What do you mean by static class members? [2]
4. Program to keep count of created objects using static members. [4]
5. Define categories of functions :- i) Accessor ii) Mutator iii)Manager

Chapter 5

CONSTRUCTORS AND DESTRUCTORS

1. Write 4 characteristics of a constructor function used in a class. [2]
2. What do you mean by a default constructor? What is it role? How is it equivalent to a constructor having default arguments? [2]
3. What do you mean by a temporary instance of a class? What is its use? How is it created? [2]
4. Discuss the various situations when a copy constructor is automatically invoked.
5. Observe the following C++ code and answer the questions (i) and (ii) : **class Traveller**

```
{
        long PNR;
        char TName[20];
public :
        Traveller() //Function 1 {cout<<"Ready"<<end1;}

        void Book(long P,char N[])                    //Function 2
        {PNR = P; strcpy(TName, N);}

        void Print()                                  //Function 3
        {cout<<PNR << TName <<end1;}

        ~Traveller()                                  //Function 4
```

{cout<<"Booking cancelled!"<<end1;}

};

i) Fill in the blank statements in Line 1 and Line 2 to execute Function 2 and Function 3 respectively in the following code : [1]

```
void main()
{
Traveller T;
_________                    //Line 1
_________                    //Line 2
}//Stops here
```

(i) Which function will be executed at }//Stops here ? What is this function referred as ? [1]

Chapter 6

INHERITANCE: EXTENDING CLASSES

1. Differentiate between protected and private members of a class in context of Object Oriented Programming. Also give a suitable example illustrating accessibility/non-accessibility of each using a class and an object in C++. [2]

2. Observe the following C++ code and answer the questions (i) and (ii). Note : Assume all necessary files are included.

```
class TEST
{
        long TCode; char TTitle[20]; float Score; public:

        TEST() //Member Function 1
        {
                TCode=100;strcpy(TTitle,"FIRST Test");Score=0;
        }

        TEST(TEST &T) //Member Function 2
        {
                TCode=E.TCode+1;
                strcpy(TTitle,T.TTitle);
                Score=T.Score;
        }

};
void main ( )

{
        _______ //Statement 1
        _______ //Statement 2

}
```

(i) Which Object Oriented Programming feature is illustrated by the Member Function 1 and the Member Function 2 together in the class TEST? [1]

(ii) Write Statement 1 and Statement 2 to execute Member Function 1 and Member Function 2 respectively. [1]

(c) Write the definition of a class BOX in C++ with the following description: [4]

Private Members

- Box Number // data member of integer type
- Side // data member of float type
- Area // data member of float type
- ExecArea ( ) // Member function to calculate and assign Area as Side * Side

Public Members

- GetBox ( ) // A function to allow user to enter values of BoxNumber and Side. Also, this // function should call ExecArea ( ) to calculate Area
- ShowBox ( ) // A function to display Box Number, Side and Area

3. Answer the questions (i) to (iv) based on the following: [4]

```
class First
{
        int X1;
        protected:
                float X2;
        public:
                First ( );
                void Enter1 ( );
                void Display1( );
};

class Second: private First
{
        int Y1;
        protected:
                float Y2;
        public:
                Second ( );
```

```
                void Enter2 ( );
                void Display ( );
};
class Third : public Second
{
        int Z1;
        public:
                Third();
                void Enter3();
                void Display();
};
void main()
{
        Third T; //Statement 1
        _________;//Statement 2
}
```

(ii) Which type of Inheritance out of the following is illustrated in the above example? Single Level Inheritance, Multilevel Inheritance, Multiple Inheritance

(iii) Write the names of all the member functions, which are directly accessible by the object T of class Third as declared in main ( ) function.

(iv) Write Statement 2 to call function Display ( ) of class Second from the object T of class Third.

(v) What will be the order of execution of the constructors, when the object T of class Third is declared inside main ( )?

Chapter 7

DATA FILE HANDLING

1. A text file named MATTER.TXT contains some text, which needs to be displayed such that every next character is separated by a symbol '#'.

   Write a function definition for HashDisplay() in C++ that would display the entire content of the file MATTER.TXT in the desired format. [3]

   Example :

   If the file MATTER.TXT has the following content stored in it :

   THE WORLD IS ROUND

The function HashDisplay() should display the following content :

T#H#E# #W#O#R#L#D# #I#S# #R#O#U#N#D#

2. Write a definition for a function TotalTeachers( ) in C++ to read each object of a binary file SCHOOLS.DAT, find the total number of teachers, whose data is stored in the file and display the same. Assume that the file SCHOOLS.DAT is created with the help of objects of class SCHOOLS, which is defined below: [2]

```
class SCHOOLS{
    int SCode; //School Code
    char SName[20]; //School Name
    int NOT; //Number of Teachers in the school
    public:
        void Display() {cout<<SCode<<"#"<<SName<<"#"<<NOT<<endl;}
        int RNOT(){return NOT;}
};
```

3. Find the output of the following C++ code considering that the binary file SCHOOLS.DAT exists on the hard disk with the following records of 10 schools of the class SCHOOLS as declared in the previous question. [1]

SCode	SName	NOT
1001	Brains School	100
1003	Child Life School	115
1002	Care Share School	300
1006	Educate for Life School	50
1005	Guru Shishya Sadan	195
1004	Holy Education School	140
1010	Play School	95

1008	Innovate Excel School	300
1011	Premier Education School	200
1012	Uplifted Minds School	100

```
void main()
{
        fstream SFIN;
        SFIN.open("SCHOOLS.DAT",ios::binary | ios::in);
        SCHOOLS S;
        SFIN.seekg(5*sizeof(S));
        SFIN.read((char*)&S, sizeof(S));
        S.Display();
        cout<<"Record :"<<SFIN.tellg()/sizeof(S) + 1<<endl;
        SFIN.close();
}
```

4. Polina Raj has used a text editing software to type some text in an article. After saving the article as MYNOTES.TXT, she realised that she has wrongly typed alphabet K in place of alphabet C everywhere in the article.
   Write a function definition for PURETEXT ( ) in C++ that would display the corrected version of the entire article of the file MYNOTES.TXT with all the alphabets ——
   K to be displayed as an alphabet "c" on screen.
   Note : Assuming that MYNOTES.TXT does not contain any C alphabet otherwise.
   Example :
   If Polina has stored the following content in the file MYNOTES.TXT:

   I OWN A KUTE LITTLE KAR.
   I KARE FOR IT AS MY KHILD

   The function PURETEXT() should display the following content:

   I OWN A CUTE LITTLE CAR.
   I CARE FOR IT AS MY CHILD.

5. Write a definition for function COUNTPICS( ) in C++ to read each object of a binary file PHOTOS.DAT, find and display the total number of PHOTOS of type PORTRAIT. Assume that the file PHOTOS.DAT is created with the help of objects of class PHOTOS, which is defined below: [2]

```
class PHOTOS
{
    int PCODE;
    char PTYPE[20];//Photo Type as "PORTRAIT","NATURE" public:
```

```
    void ENTER()
    {
            cin>>PCODE;gets(PTYPE);
    }
    void SHOWCASE()
    {
            cout<<PCODE<<":" <<PTYPE<<endl;
    }
    char *GETPTYPE(){return PTYPE;}
};
```

6. Find the output of the following C++ code considering that the binary file CLIENTS.DAT exists on the hard disk with a data of 200 clients : [1]

```
class CLIENTS
{
        int CCode; char CName[20];
        public:
                void REGISTER ( );
                void DISPLAY();
 };
void main ( )
{
        fstream File;
        File.open("CLIENTS.DAT",ios::binary|ios::in);
        CLIENTS C; File.seekg(6*sizeof(C));
         File.read((char*)&C, sizeof(C));
        cout<<"Client Number:"<<File.tellg()/sizeof(C) + 1;
        File.seekg(0,ios::end);
        cout<<" of "<<File.tellg()/sizeof(C)<<endl; File.close();
}
```

7. Aditi has used a text editing software to type some text. After saving the article as **WORDS.TXT**, she realised that she has wrongly typed alphabet J in place of alphabet I everywhere in the article. [3]

   Write a function definition for **JTOI()**in C++ that would display the corrected version of entire content of the file **WORDS.TXT** with all the alphabets "J" to be displayed as an alphabet "I" on screen.

   Note : Assuming that **WORD.TXT** does not contain any J alphabet otherwise.

   Example :

   If Aditi has stored the following content in the file **WORDS.TXT :**

   WELL, THJS JS A WORD BY JTSELF. YOU COULD STRETCH THJS TO BE A SENTENCE

   The function **JTOI( )** should display the following content :

   WELL, THIS IS A WORD BY ITSELF. YOU COULD STRETCH THIS TO BE A SENTENCE.

8. Write a definition for function COUNTDEPT( ) in C++ to read each object of a binary file TEACHERS.DAT, find and display the total number of teachers in the department MATHS. Assume that the file TEACHERS.DAT is created with the help of objects of class TEACHERS, which is defined below : [2]

```
class TEACHERS
{
    int TID; char DEPT[20];
public:
    void GET()
    {
        cin>>TID;gets(DEPT);
    }
    void SHOW()
    {
        cout<<TID<<":"<<DEPT<<end1;
    }
    char *RDEPT(){return DEPT;}
};
```

9. Find the output of the following C++ code considering that the binary file BOOK.DAT exists on the hard disk with a data of 200 books. [1]

```
class BOOK
{
    int BID;char BName[20];
public:
    void Enter();void Display();
};
void main()
{
    fstream InFile;
    InFile.open("BOOK.DAT",ios::binary|ios::in);
    BOOK B;
    InFile.seekg(5*sizeof(B));
    InFile.read((char*)&B, sizeof(B));
    cout<<"Book Number:"<<InFile.tellg()/sizeof(B) + 1;
    InFile.seekg(0,ios::end);
    cout<<" of "<<InFile.tellg()/sizeof(B)<<end1; InFile.close();
}
```

10. (a) Fill in the blanks marked as Statemen1 and Statemnet2, in the program segment given below with appropriate functions for the required task.

```
class Medical
{
    int  RNo;
    char Name[20];
```

```
        char Mobile[12];
        public:
                void Input();
                void Show();
                int RRno(){return RNo;}
                void ChangeMobile();
};
void RepUpdate()
{
        fstream F;
        F.open("REP.dat",ios::binary|ios::in|ios::out);
        int Change=0;
        int URno;
        cout<<"Rno(Rep No – to update Mobile):";
        cin>>URno;
        Medical M;
        while(!F.eof())
        {
                if(M.RRno()==URno)
                {
                        //Statement 1: To call the function to change Mobile No.
                        _____________________________________________;
                        //Statement 2: To reposition file pointer to re-write the
                        //updated object back in the file
                        _____________________________________________;
                        F.write((char *)&M, sizeof(M));
                        Change++;
                }
        }
        if(change)
                cout<<"Mobile Changed for rep"<<URno<<endl;
        else
                cout<<"Rep not in Medical.txt"<<URno<<endl;

        F.close();
}
```

(b) Write a function EUCount() in C++, which should read each character of attest file IMP.txt, should count and display the occurrence of alphabets E and U(including small cases e and u too).

(c) Assuming the class GAMES as declared below, write a function in C++ to read the objects of GAMES from binary file GAMES.DAT and display those details of those GAMES, which are meant for children of AgeRange "8 to 13".

11. Write a function in C++ to search for a camera from a binary file "CAMERA.DAT" containing the objects of class CAMERA(as defined below). The user should enter the Model No and the function should search and display the details of the Camera.

```
class CAMERA
{
```

```
    long ModelNo;
    float MegaPixel;
    int Zoom;
    char Details[120];
    public:
        void Enter(){.....}
        void Display(){.....}
        long GetModelNo(){return ModelNo;}
};
```

Chapter 11 & 12
DATABASE CONCEPTS AND STRUCTURED QUERY LANGUAGE

1. Differentiate between candidate key and Alternate key in context of RDBMS. [1]
2. Differentiate between primary key and Alternate key in context of RDBMS. [1]
3. Differentiate between candidate key and Primary key in context of RDBMS. [1]
4. What is primary key in a table? [1]
5. What do you understand by the terms Candidate key and cardinality of a relation in relational database? [1]
6. Differentiate between the terms Degree and cardinality in context of RDBMS. [1]
7. Explain the concept of Cartesian product between two tables, using appropriate example. [1]
8. What are DDL and DML? [1]
9. Suppose table T1 has 4 rows and 2 columns and another table T2 has 3 rows and 2 columns. Find the degree and cardinality of table T3 which is the Cartesian product of T1 and T2. [1]
10. (a) Observe the following STUDENTS and EVENTS tables carefully and write the name of the RDBMS operation which will be used to produce the output as shown in LIST. Also, find the Degree and Cardinality of the LIST. **2**

STUDENTS

NO	NAME
1	Tara Mani
2	Jaya Sarkar
3	Tarini Trikha

EVENTS

EVENTCODE	EVENTNAME
1001	Programming
1002	IT Quiz

LIST

NO	NAME	EVENTCODE	EVENTNAME
1	Tara Mani	1001	Programming
1	Tara Mani	1002	IT Quiz
2	Jaya Sarkar	1001	Programming
2	Jaya Sarkar	1002	IT Quiz
3	Tarini Trikha	1001	Programming
3	Tarini Trikha	1002	IT Quiz

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

Table : VEHICLE

CODE	VTYPE	PERKM
101	VOLVO BUS	160
102	AC DELUXE BUS	150

103	ORDINARY BUS	90
105	SUV	40
104	CAR	20

Note :

- PERKM is Freight Charges per kilometer
- VTYPE is Vehicle Type

Table : TRAVEL

NO	NAME	TDATE	KM	CODE	NOP
101	Janish Kin	2015-11-13	200	101	32
103	Vedika Sahai	2016-04-21	100	103	45
105	Tarun Ram	2016-03-23	350	102	42
102	John Fen	2016-02-13	90	102	40
107	Ahmed Khan	2015-01-10	75	104	2
104	Raveena	2016-05-28	80	105	4
106	Kripal Anya	2016-02-06	200	101	25

Note :

- NO is Traveller Number
- KM is Kilometer travelled
- NOP is number of travellers travelled in vehicle
- TDATE is Travel Date

(i) To display NO, NAME, TDATE from the table TRAVEL in descending order of NO.

(ii) To display the NAME of all the travellers from the table TRAVEL who are travelling by vehicle with code 101 or 102.

(iii) To display the NO and NAME of those travellers from the table TRAVEL who travelled between '2015-12-31' and '2015-04-01'.

(iv) To display all the details from table TRAVEL for the travellers, who have travelled distance more than 100 KM in ascending order of NOP.

(v) `SELECT COUNT (*), CODE FROM TRAVEL GROUP BY CODE HAVING COUNT(*)>1;`

(vi) `SELECT DISTINCT CODE FROM TRAVEL;`

(vii) `SELECT A.CODE,NAME,VTYPE FROM TRAVEL A,VEHICLE B WHERE A.CODE=B.CODE AND KM<90;`

(viii) `SELECT NAME,KM*PERKM FROM TRAVEL A, VEHICLE B WHERE A.CODE=B.CODE AND A.CODE='105';`

11. (a) Observe the following table CANDIDATE carefully and write the name of the RDBMS operation out of (i) SELECTION (ii) PROJECTION (iii) UNION (iv) CARTESIAN PRODUCT, which has been used to produce the output as shown in RESULT. Also, find the Degree and Cardinality of the RESULT. **2**

TABLE : CANDIDATE

NO	NAME	STREAM
C1	AJAY	LAW

C2	ADITI	MEDICAL
C3	ROHAN	EDUCATION
C4	RISHAV	ENGINEERING

RESULT

NO	NAME
C3	ROHAN

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

TABLE : BOOK

Code	BNAME	TYPE
F101	The priest	Fiction
L102	German easy	Literature
C101	Tarzan in the lost world	Comic
F102	Untold Story	Fiction
C102	War heroes	Comic

TABLE : MEMBER

MNO	MNAME	CODE	ISSUEDATE
M101	RAGHAV SINHA	L102	2016-10-13
M103	SARTHAK JOHN	F102	2017-02-23
M102	ANISHA KHAN	C101	2016-06-12

(b) To display all details from table MEMBER in descending order of ISSUEDATE.

(c) To display the BNO and BNAME of all Fiction Type books from the table BOOK.

(d) To display the TYPE and number of books in each TYPE from the table BOOK.

(e) To display all MNAME and ISSUEDATE of those members from table MEMBER who have books issued (i.e. ISSUEDATE) in the year 2017.

(f) `SELECT MAX(ISSUEDATE) FROM MEMBER;`

(g) `SELECT DISTINCT TYPE FROM BOOK;`

(h) `SELECT A.CODE,BNAME,MNO,MNAME`

```
FROM BOOK A, MEMBER B WHERE A.CODE=B.CODE;
```

(i)
```
SELECT BNAME FROM BOOK
WHERE TYPE NOT IN ("FICTION","COMIC");
```

12. (a)Observe the following table carefully and write the names of the most appropriate columns, which can be considered as (i) candidate keys and (ii) primary key. **2**

Id	Product	Qty	Price	Transaction Date
101	Plastic Folder 12"	100	3400	2014-12-14
104	Pen Stand Standard	200	4500	2015-01-31
105	Stapler Medium	250	1200	2015-02-28
109	Punching Machine Big	200	1400	2015-03-12
103	Stapler Mini	100	1500	2015-02-02

(b) Consider the following DEPT and WORKER tables. Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii) : **6**

Table : DEPT

DCODE	DEPARTMENT	CITY
D01	MEDIA	DELHI
D02	MARKETING	DELHI
D03	INFRASTRUCTURE	MUMBAI
D05	FINANCE	KOLKATA
D04	HUMAN RESOURCE	MUMBAI

Table : WORKER

WNO	NAME	DOJ	DOB	GENDER	DCODE
1001	George K	2013-09-02	1991-09-01	MALE	D01
1002	Ryma Sen	2012-12-11	1990-12-15	FEMALE	D03
1003	Mohitesh	2013-02-03	1987-09-04	MALE	D05
1007	Anil Jha	2014-01-17	1984-10-19	MALE	D04
1004	Manila Sahai	2012-12-09	1986-11-14	FEMALE	D01
1005	R SAHAY	2013-11-18	1987-03-31	MALE	D02
1006	Jaya Priya	2014-06-09	1985-06-23	FEMALE	D05

Note : DOJ refers to date of joining and DOB refers to date of Birth of workers.

(i) To display Wno, Name, Gender from the table WORKER in descending order of Wno.

(ii) To display the Name of all the FEMALE workers from the table WORKER.

(iii) To display the Wno and Name of those workers from the table WORKER who are born between '1987-01-01' and '1991-12-01'.

(iv) To count and display MALE workers who have joined after '1986-01-01'.

(v)
```
SELECT COUNT(*), DCODE FROM WORKER
GROUP BY DCODE HAVING COUNT(*)>1;
```

(vi)
```
SELECT DISTINCT DEPARTMENT FROM DEPT;
```

(vii)
```
SELECT NAME, DEPARTMENT, CITY FROM WORKER W,DEPT D WHERE
W.DCODE=D.DCODE AND WNO<1003;
```

(viii)
```
SELECT MAX(DOJ), MIN(DOB) FROM WORKER;
```

13. (a) Verify the following using Boolean Laws. **2**

`X + Y' = X.Y+X.Y'+X'.Y'`

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

`(U + V').W' + Z`

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

A	B	C	F(A,B,C)
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

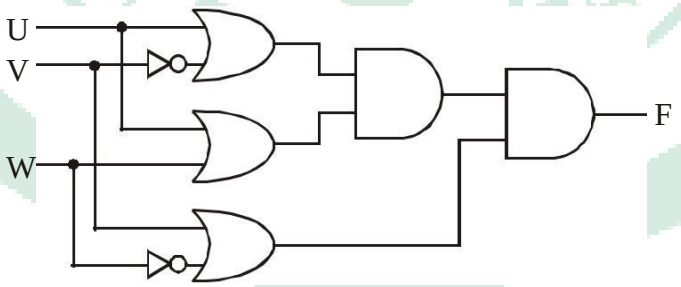
(d) Reduce the following Boolean Expression to its simplest form using K-Map : **3**

`F(X,Y,Z,W) = Σ(0,1,6,8,9,10,11,12,15)`

14. (a) Verify the following using Boolean Laws : **2**

`A'+ B'.C=A'.B'.C'+ A'.B.C'+ A'.B.C + A'.B'.C+ A.B'.C`

(b) Write the Boolean Expression for the result of the Logic Circuit as shown below : **2**



(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	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

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

F(X,Y,Z,W) = Σ(2,6,7,8,9,10,11,13,14,15)

15. (a) State any one Absorption Law of Boolean Algebra and verify it using truth table. [2]

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

(U' + V).(V' + W')

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

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

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

G(U,V,W,Z) = $\sum$(3,5,6,7,11,12,13,15)

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