<table>
<thead>
<tr>
<th>Q.NO</th>
<th>QUESTIONS</th>
<th>MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(a)</td>
<td>Illustrate the purpose of scope resolution operator in C++ with example.</td>
<td>2</td>
</tr>
</tbody>
</table>
| 1(b) | Which C++ header file(s) will be essentially required to be included to run / execute the following C++ code:  
void main()  
{  
char Msg[ ]="CBSE 2014";  
for (int i=5;Msg[i];i++)  
puts(Msg);  
}  
                                                                 | 1     |
| 1(c) | Rewrite the following program after removing the syntactical errors (if any). Underline each correction.  
#include "iostream.h"  
struct MEMBER  
{  
int Mno;float Fees;  
} M=[ 4, 6 . 50];  

void main()  
{  
cout<< Mno<< Fees;  
}  
Find the output of the following program:  
#include<iostream.h>  
void main()  
{  
int C []= { 11,33,22,55,44};  
int *ptr= C;  
int *t = &C[4];  
for(int i =0;i<2; i++)  
{  
cout<< C[i]<<"\t"<<*t - - <<"\t"<<*++ptr <<endl;  
}  
}  
                                                                 | 2     |
(e). Find the output of the following program:
```cpp
#include <iostream.h>
calculate(int x)
{
    if(x%2)
        return ++x;
    else
        return x++;
}
void design( char ch, int n=2)
{
    for(int i=0;i<n;i++)
        cout<<calculate(i)<<ch;
    cout<<endl;
}
void main()
{
    design("*");
    design( '@',4);
    design( '#',3);
}
```

(f). In the following C++ program what is the expected value from options(i) to(iv) given below: justify your answer
```cpp
#include <iostream.h>
#include<stdlib.h>
void main()
{
    randmize();
    int x = 5, N;
    for(int i =1;i<=4;i++)
    {
        N = 25+ random(x);
        Cout<<N<<" : ";
        x--;
    }
```

<table>
<thead>
<tr>
<th>Q.NO</th>
<th>2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a).</td>
<td>What do you understand by polymorphism? Give an example illustrating its use in C++ program.</td>
</tr>
</tbody>
</table>
| (b). | Answer the questions (i) and (ii) after going through the following program:
|     | class Match |
|     | { |
|     | int Time; |
|     | public: |
|     | Match0//Function 1 |
|     | { |
|     | Time=0; |
|     | cout<<"Match commences"<<endl; |
|     | } |
void Details() //Function 2
{
    cout<<"Inter Section Basketball Match"<<endl;
}

Match(int Duration) //Function 3
{
    Time=Duration;
    cout<<"Another Match begins now"<<endl;
}
~Match(){ } // function -4
;
    i) Write statements that would call the member Function 2 and function 3
    ii) When function-4 does execute?

(c) Define a class Garments in C++ with the following descriptions:

Private Members:
GCode     of type string
GType     of type string
GSize     of type integer
GFabric   of type string
Gprice    of type float

A function Assign( ) which calculates and assigns the value of GPrice as follows:

For the value of GFabric as “COTTON”

    GType     GPrice(Rs)
    TROUSER  1300
    SHIRT    1100

Or GFabric other than “COTTON” the above mentioned GPrice gets reduced by 10%.

Public Members:
A constructor to assign initial values of GCode, GType and GFabric with the word
"NOT ALLOTED" and gsize and GPrice with 0.

A function Input( ) to input the values of the data members GCode, GType, GSize
and GFabric and invoke the Assign( ) function.

A function Display( ) which displays the content of all data members for a Garment.

(d) Answer the questions (i) to (iv) based on the following:
class PUBLISHER
{
    char Pub[12];
    long double Turnover;
    protected:
    void Register();
    public:
    PUBLISHER();
    void Enter();
    void Display();
class BRANCH
{
    char CITY[20];
    protected:
    float Employees;
    public:
    BRANCH();
    int bno;
    void Haveit();
    void Giveit();
};

class AUTHOR : private BRANCH , public PUBLISHER
{
    int Acode;
    char Aname[20];
    float Amount[3];
    public:
    AUTHOR();
    void Start();
    void Show();
};

(i) Write the names of data members, which are NOT accessible from objects belonging to class AUTHOR.

(ii) Write the names of all the member functions which are accessible from objects of class BRANCH.

(iii) Write the order of execution of constructors when you create object of class AUTHOR.

(iv) How many bytes will be required by an object belonging to class AUTHOR?

---

Q.NO 3(a) Write a user defined function in C++ SHIFT(int [], int) that would accept one dimensional integer array. The function should shift the negative numbers of an array to left and the positive numbers to right without using second array.
For example if array initially contains

3  -5  1  3  7  0  -15  3  -7  -8

Then after shifting negative to left and positive to right array should contain:
-5  -15  -7  -8  3  1  3  7  0  3

(b) An array Arr[40][10] is stored in the memory along the column with each element occupying 4 bytes. Find out the address of the location Arr[3][6] if the location Arr[30][10] is stored at the address 9000

(c) Write a user defined function in C++ MAX(int X[][10], int N, int M) to find and return the maximum number in stored in two dimensional array X.

(d) Convert the following infix expression into postfix expression with help of stack; and show the status of stack after each execution.

A * B + (C - D)/F
(e). Write a COMPLETE PROGRAM IN C++ to implement dynamically allocated queue containing names of cities.

Q.NO 4 (a)
A binary file “Students.dat” contains data of 100 students where each student’s data is an object of the following class:

```
class Student
{
    long Rno; char Name[20];
    public:
        void EnterData() {cin>>Rno; cin.getline(Name,20);
        void ShowData() {cout<<Rno<<" - "<<Name<<endl;}
    }
```

With reference to this information, write output of the following program segment:

```
ifstream File; Student S;
File.open("STUDENTS.DAT", ios::binary|ios::in);
File.seekg(0, ios::end);
    Cout<<File.tellg();
```

(b). Write a function to read a text file PARA.TXT and replace every sequence of consecutive space by a single space and display file content on the screen.

For example if the file PARA.TXT contains the following:

```
This is to test.
```

The output should be: This is to test.

(c). Given a binary file PHONE.DAT, containing records of the following:

```
class Phonelist
{
    char Name[20];
    char Address[30];
    char AreaCode[5];
    char PhoneNo[15];
    public:
        void Register();
        Void Show();
        int CheckCode(char AC[])
        {
            return strcmp(AreaCode, AC);
        }
    }
```

Write a function TRANSFER( ) in C++, that would copy all those records which are having AreaCode as “DEL” from PHONE.DAT to PHONBACK.DAT.

Q.NO 5 (a). What do you understand by the terms PROJECTION and UNION in relational algebra? Explain with example.
Consider the following tables. Write SQL commands for the statements (i) to (iv) and write output for (V.) to (viii)

<table>
<thead>
<tr>
<th>EMP</th>
<th>Empno</th>
<th>Ename</th>
<th>Job</th>
<th>Mgr</th>
<th>Hiredate</th>
<th>Sal</th>
<th>Comm.</th>
<th>Deptno</th>
</tr>
</thead>
<tbody>
<tr>
<td>7839</td>
<td>King</td>
<td>President</td>
<td></td>
<td>17-nov-81</td>
<td>5000</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7698</td>
<td>Blake</td>
<td>Manager</td>
<td>7839</td>
<td>01-may-81</td>
<td>2850</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7782</td>
<td>Clark</td>
<td>Manager</td>
<td>7839</td>
<td>09-jun-81</td>
<td>2450</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7566</td>
<td>Jones</td>
<td>Manager</td>
<td>7839</td>
<td>02-apr-81</td>
<td>2975</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7654</td>
<td>Martin</td>
<td>salesman</td>
<td>7698</td>
<td>28-sep-81</td>
<td>1250</td>
<td>1400</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>7499</td>
<td>Allen</td>
<td>Salesman</td>
<td>7698</td>
<td>20-feb-81</td>
<td>1600</td>
<td>300</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>7844</td>
<td>Turner</td>
<td>Salesman</td>
<td>7698</td>
<td>08-sep-81</td>
<td>1500</td>
<td>0</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>7900</td>
<td>James</td>
<td>Clerk</td>
<td>7698</td>
<td>03-dec-81</td>
<td>950</td>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>7521</td>
<td>Ward</td>
<td>Salesman</td>
<td>7698</td>
<td>22-feb-81</td>
<td>1250</td>
<td>500</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>7902</td>
<td>Ford</td>
<td>Analyst</td>
<td>7566</td>
<td>03-dec-81</td>
<td>3000</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>7369</td>
<td>Smith</td>
<td>Clerk</td>
<td>7902</td>
<td>17-dec-80</td>
<td>800</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>7788</td>
<td>Scott</td>
<td>Analyst</td>
<td>7566</td>
<td>09-dec-82</td>
<td>3000</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>7876</td>
<td>Adams</td>
<td>Clerk</td>
<td>7788</td>
<td>12-jan-83</td>
<td>1100</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>7934</td>
<td>Miller</td>
<td>Clerk</td>
<td>7782</td>
<td>23-jan-82</td>
<td>1300</td>
<td></td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPT</th>
<th>Deptno</th>
<th>Deptname</th>
<th>Loc</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Accountaing</td>
<td>New York</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Research</td>
<td>Dallas</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Sales</td>
<td>Chicago</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Operations</td>
<td>Boston</td>
<td></td>
</tr>
</tbody>
</table>

i. To display the name and salary of all managers working in New York
ii. To show number of employees having commission
iii. To display whole table alphabetical order of name
iv. To increase salary of all manager by 25 and commission by 50
v. SELECT JOB, SUM(SAL), COUNT(*) FROM EMP GROUP BY JOB;
vi. SELECT AVG(COMM) FROM EMP ;
vii. SELECT ENAME, SAL, SAL*12 FROM EMP where job = 'manager';
viii. SELECT ename FROM EMP WHERE SAL <= 1500;

Q.NO 6 (a).
Verify the following using Boolean Laws.

\[ AB + BC + A'C = AB + A'C \]

Obtain the Boolean Expression for the logic circuit shown below:
Write the sum of product of the function \( F(A, B, C) \) for the following truth table representation of \( F \):

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Obtain the minimal form for the following Boolean expression using Karnaugh's Map.

\[ F(A, B, C, D) = \prod (0, 1, 2, 4, 6, 8, 9, 10, 12, 14) \]

Q.NO 7
(a) Differentiate packet switching and message switching technique in network communication,

(b) Differentiate between BUS and STAR topology of networks.

(c) What do you mean by servers side scripting? Name one server side scripting language.

(d) What is web 2.0?

(e) Name two propriety softwares along with their application.

(f) How Trojan horses are different from worms? Mention any one difference.

(g) 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:
Approximate distances between these Units is as follows:

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
<th>DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>50M</td>
</tr>
<tr>
<td>B</td>
<td>C</td>
<td>150M</td>
</tr>
<tr>
<td>C</td>
<td>D</td>
<td>25M</td>
</tr>
<tr>
<td>A</td>
<td>D</td>
<td>170M</td>
</tr>
<tr>
<td>B</td>
<td>D</td>
<td>125M</td>
</tr>
<tr>
<td>A</td>
<td>C</td>
<td>90M</td>
</tr>
</tbody>
</table>

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25</td>
</tr>
<tr>
<td>B</td>
<td>50</td>
</tr>
<tr>
<td>C</td>
<td>125</td>
</tr>
<tr>
<td>D</td>
<td>10</td>
</tr>
</tbody>
</table>

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

ALL THE BEST