Student Name: _____ Subject Code: 083

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FIRST PRE-BOARD EXAMINATION (SESSION 2011 - 12)

Class: XII Subject: Computer Science (083) Time: 03:00 Hrs MM=70

General Instructions

(i) All questions are compulsory.

(ii) Programming Language C++

Q1. (a) What is the difference static and dynamic memory allocation? Explain giving example. [2]

(b) Name the Header file(s) that shall be needed for the following C++ code [1]

```
void main()
{
        char word[30];
        strcpy ( word, "Pre Board Examination ");
        int s = strlen (word);
        if(s%2 = = 0)
        cout<<setw(20)<<word;
}
```

(c) Rewrite the following C++ program code after removing the syntax error(s) (if any). Underline each correction. [2]

```
#include<iostream.h>
class Student
{
        long admNumber;
        char name[30];

public →
        void addDetail(long a, char b[])
        {
                admNumber=a;
                name=b;
        }

        void showDetail()
        {
                cout<<"\n Admission Number :"<<admNumber;
                cout<<"\n Name of the student :"<<name;
        }
}
```

(d) Find the output of the following program: [3]

```
#include<iostream.h>
void switchOver(int A[], int N, int split)
{
        for(int k=0; k<N; k++)
        {
                if(k<split)     A[k] +=k;
                else            A[k] *=k;
        }
}
void display(int A[], int N)
{
        for (int k=0; k<N; k++)
                (k%2==0)? cout<<A[k]<<"%" : cout<<A[k]<<endl;
}
void main()
{
        int X[]={30, 40, 50, 20, 10, 5};
        switchOver(X, 6, 3);
        display(X, 6);
}
```

(e) Find the output of the following program: [2]

```
#include<iostream.h>
void main()
{
        int *Q, M[]={11, 22, 33, 44};
        Q=M;
        M[2] += 22;
        cout<<" Queen @ "<<*Q <<endl;
        *Q -  = 11;
        Q += 2;
        cout<<" Now @"<< *Q <<endl;
        Q++;
        cout<<"Finally @"<< *Q <<endl;
        cout<<"New Value @"<<M[0] <<endl;
}
```

(f) In the following program, find the correct possible output(s) from the options: [2]

```
#include<iostream.h>
#include<stdlib.h>
void main()
{
        randomize();
        int MyNum, Max=5;
        MyNum = 20 + random(Max);

        for(int N=MyNum; N<=25; N++)
                cout<<N<<"*";
}
```

OUTPUTS:

(i) 20*21*22*23*24*25 (ii) 22*23*24*25*

(iii) 23*24* (iv) 21*22*23*24*25

Q2. (a) Answer the questions (i) to (iv) based on the following: [4]

```
class MNC
{
        char Cname[25];                 // Company name
protected:
        char Hoffice[25];               // Head Office
public:
        char Country[25];
        MNC();
        void enterData();
        void displayData();
};

class Branch : public MNC
{
        long NOE;                       // Number Of Employee
        char Ctry[25];                  // Country
protected:
        void association();
public:
        Branch();
        void add();
        void show();
};

class Outlet : public Branch
{
        char state[25];
public:
        Outlet();
        void enter();
        void output();
};
```

(i) Which type of inheritance is shown in the above example?
(ii) Which class' constructor will be called first at the time of declaration of an object of class Outlet? Give their proper order.
(iii) How many bytes does an object belonging to class Outlet require?
(iv) Name the data member(s), which are accessible from the object(s) of class Branch.

(b) Answer the questions (i) to (ii) after going through the following class: [2]

```
class Computer
{
        char C_name[20];
        char Config[100];
public:
        Computer();                     // function 1
        Computer(char[],char []);       // function 2
        ~Computer()                     // Function 3
};
```

(i) As per Object Oriented Programming, which concept is illustrated by **function 1** and **function 2** together?

(ii) What is **function 3** referred as? Write at least two important features of **function 3**.

(c) Differentiate between Constructor and Destructor function with respect to OOPS giving suitable example. [2]

(d) Define a class Student with the following specifications: [4]

Class name	Data Members	Type
Student	Std_name	string
	Std_rollno	long
	Marks	float
	Stream	string

A function assign_stream( ) to assign stream on the following basis:

Marks	Stream
300 and above	Science
Between 250 and 300	Commerce
Between 200 and 250	Humanities
Below 200	NULL

Public Member Functions:

- A constructor to initialize data members with legal initial values.
- A func initialize() to input the values for the data members and invoke assign_stream()
- A function to display the values of data members.

Q3. (a) Write a function in C++ to combine the contents of two equi-sized arrays A and B by computing their corresponding elements with the formula 2*A[i]+3*B[i]; where value i varies from 0 to N-1 and transfer the resultant content in the third same sized array. [4]

(b) An array A[50][20] is stored in the memory along the row with each element requiring 8 bytes of storage. Find out the location of A[10][15], if A[0][0] is stored at 4200. [4]

(c) Define a function SWAPCOL() in C++ to swap (interchange) the first column with the last column elements, for a two dimensional integer array passed as the argument of the function [2]

For Example

If the 2-D array contains

2	1	4	9
1	3	7	7
5	8	6	3
7	2	1	2

After swapping the contents of the columns

9	1	4	2
7	3	7	1
3	8	6	5
2	2	1	7

(d) Evaluate the following postfix notation of expression: [2]

(Show status of Stack after each operation)

True, False, NOT, AND, True, True, AND, OR

(e) Convert the following infix expression into postfix expression : [2]

(A * (B + (C + D) * (E + F) / G)) / H

Q4. (a) Observe the program segment given below carefully and fill the blanks marked as statement 1 and statement 2 using tellg() and seekp() functions for performing the required task. [1]

```
#include<fstream.h>
class Customer
{
        long Cno;
        char Name[20];
        char Phone[12];

public:
        void enter();          // Function to allow user to enter Cno, Name, Phone
        void modify();         // Function to allow user to modify Phone number

        long getCno()          // Function to return value of Cno
        {
                return Cno;
        }
};


void changePhoneNumber()
{
        Customer C;
        fstream fil;
        fil.open ("c_data.dat", ios::binary | ios::in | ios::out);
        long inp;

        cout<<"\nEnter the customer number whose phone number to change :":
        cin>>inp;

        while(fil.read((char*)&C, sizeof(C)))
        {
                if( inp == C.getCno())
                {
                C.modify();

                // statement 1: To find the current position of file pointer
                int pos=_________________

                // statement 2: To move the file pointer to write the modified record back
                onto the file for the desired inp

                _________________________

                fil.write((char*)&C, sizeof(C));
                }
        }

        fil.close();
}
```

(b) Write a func. in C++ to count the number of digits present in a text file "ARTICLE.TXT". [2]

(c) Write a function **searchBook()** in C++, which input bookNo as argument to search for a BookNo from a binary file "BOOK.DAT", assuming the binary file is containing the objects of the following class: [3]

```
class BOOK
        {
        int Bno;
        char Title[20];

public:
        int getBno()        { return Bno;                          }
        void Enter()        { cin>>Bno;  gets(Title);              }
        void Display()      { cout<<Bno<<" "<<Title<<endl; }
};
```

Q5. (a) What do you understand by Selection & Projection operations in relational algebra? [2]

(b) Consider the following tables Employee and Salgrade. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii)

Table: Employee

ecode	Name	Design	sgrade	doj	dob
101	Kapil Dev	Executive	S03	23-Mar-2003	13-Jan-1980
102	Ravi Chander	Head-IT	S02	12-Feb-2010	22-Jul-1987
103	Jim Carry	Receptionist	S03	24-Jun-2009	24-Feb-1983
105	Harsh Bhogle	GM	S02	11-Aug-2006	03-Mar-1984
108	Dinesh Kartik	CEO	S01	29-Dec-2004	19-Jan-1982

Table : Salgrade

sgrade	salary	hra
S01	56000	18000
S02	32000	12000
S03	24000	8000

i) To display the details of all employees in descending order of doj. [1]

ii) To display name and design of those employees, whose salgrade is either S02 or S03. [1]

iii) To display the content of all the employees table, whose doj is in between '09-Feb-2006' and '08-Aug-2009'. [1]

iv) To add a new row with the following details: [1]

109, 'Madhubala', 'Executive', 'S02', '09-Sep-2007', '21-Apr-1983'

v) Select count(sgrade), sgrade from employee group by sgrade; [½]

vi) Select min(dob), max(doj) from employee; [½]

vii) Select name, salary from employee e, salgrade s [½]
where e.sgrade=s.sgrade and e.ecode<103;

viii) Select sgrade, salary+hra as 'Net Salary' from salgrade where sgrade = 'S02' [½]

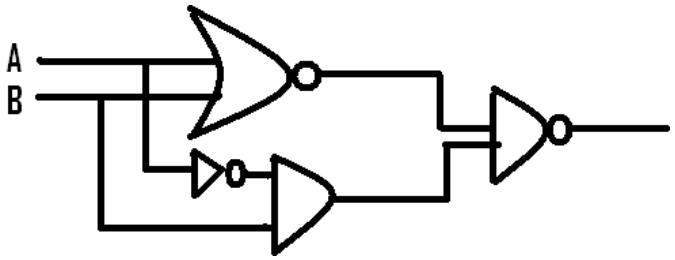
Q6. (a) Verify the following using Truth Table [2]

$X + Y.Z = (X+Y).(X+Z)$

(b) Write the SOP form of a Boolean function G, which is represented in a truth table as follows: [1]

X	Y	Z	G
0	0	0	**1**
0	0	1	**0**
0	1	0	**1**
0	1	1	**0**
1	0	0	**1**
1	0	1	**1**
1	1	0	**0**
1	1	1	**1**

(c) Write the equivalent Boolean expression for the following logic circuit. [2]



(d) Reduce the following Boolean expression using K-map: [3]
$F(w, x, y, z) = \Sigma (0, 1, 2, 4, 5, 6, 8, 10)$

Q7. (a) Differentiate between XML and HTML. [1]

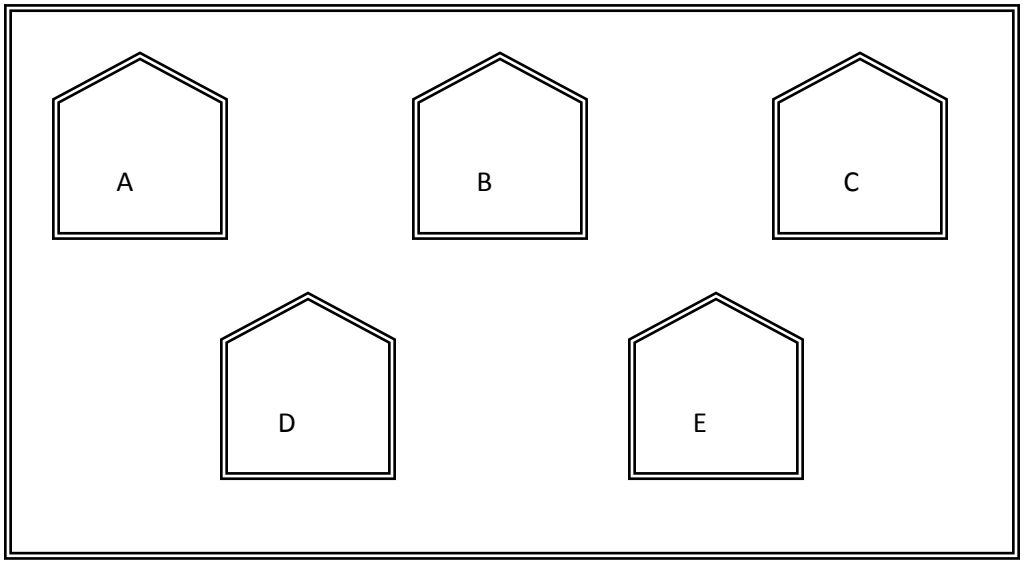
(b) Expand the following terminologies: [2]
i) CDMA ii) GSM
iii) FTP iv) SIM

(c) What is the purpose of using a Web Browser? [2]
Name any two commonly used Web Browser.

(d) Out of the following, identify client side script(s) and server side script(s). [1]
i) java script ii) ASP
iii) vb script iv) PHP

(e) Compare Open Source Software and Proprietary Software. [1]

(f) Sun Microsystems Group has set up its new center at India for its office and web based activities. It has five buildings as shown in the diagram below:



Center to center distance between various buildings

A to B	50 Mts
B to C	30 Mts
C to D	30 Mts
D to E	35 Mts
E to C	40 Mts

No of computers

A	55
B	180
C	60
D	55
E	70

i) Suggest a possible cable layout for connecting the buildings. [1]

ii) Suggest the most suitable place to house the server of this organization with a suitable reason. [1]

iii) Suggest the placement of the following devices with justification. [1]

A) Hub/Switch B) Modem

-------- Best Of Luck -------