Reg. No:									

CODE-2011-12/II/083

NAME OF THE CANDIDATE:.....

AISSCE COMMON MODEL EXAMINATION 2011-12

Subject – Computer Science [083]

Time Allotted: 3 Hours Maximum Marks: 70

General Instructions:

- Please check that this question paper contains **12** printed pages.
- Roll number and name of the candidate should be written on the title page of the answer-sheet as well as on the question paper in the space provided for the purpose.
- Please check that this question paper contains **7** questions.
- **Please write down the Serial Number of the question before attempting it.**
- Use of calculators is not permitted.
- A cooling time of 15 minutes has been allotted for the student to read this question paper and hence the same will be distributed 15 minutes before the scheduled time. During this time, the student will read the question paper only and will not write any answer on the answer sheet
- **All** questions are compulsory.
- Programming language C++.

Question I

(a) Explain '*Cascading of operators*' with an example. [2]

(b) Which C++ header file(s) will be essentially required to be included to run/execute the following C++ code : [1]

```
#include<iostream.h>
void main()
{
char* STRING;
int NUMBER;
cout<<endl<<"Enter a positive integer from keyboard ";
cin>>NUMBER;
itoa(NUMBER, STRING, 10);
cout<<endl<<number<<" contains "<<strlen( STRING )<<" digits ";
}
```

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

```
#include<iostream.h>
#define SIZE = 100;
class FLIGHT
```

_____@@_____

```
{
long FlightCode = 0;
char Description[SIZE];
void FLIGHT()
{
Description[0] = '\0';
}
void ENTER()
{
cout<<endl<<"Enter Flight Code from keyboard : ";
cin>>FlightCode;
cout<<endl<<"Enter the description : ";
cin>>Description;
}
};
void main(){
FLIGHT COC;
}
```

(d) Find the output of the program given below. (Assume that all the required header files are included in the program.) [3]

```
void main(){
char L[] = "Gd@ 8!";
for( int I = 0; L[I] != '\0'; I++)
{
if( isdigit( L[I] ) )
L[I] = L[I] + 2;
else if( !isalpha(L[I] ) )
L[I] = '$';
else if( islower(L[I]) )
L[I] = L[I] + 1;
else L[I] = L[I+1];
}
cout<<L<<endl;
}
```

(e) Find the output of the program given below. (Assume that all the required

header files are included in the program.) [2]

```
void main(){
int x[3][5] = { {18, 20, 13, 24, 35 },
{ 7, 8, 6, 19, 10} ,
{ 19, 22, 30, 21, 15}
};
int *n = &x[0][0];
cout<<endl<<(*( n + 3 ) + 1)<<" : "<<*( *x + 2 ) + 5;
cout<<endl<<*(*(x + 2 ) + 1)<<" : "<< *( x[1] + 2 ) + 5;
}
```

(f) Go through the following C++ code; find out the ***correct possible output(s)*** from the suggested output options i) to iv). Also write the ***highest value*** which can be assigned to variable G : [2]

```
#include<iostream.h>
#include<stdlib.h>
void main( )
{
randomize( );
int G,H=5;
G=random(H)+30;
for(int i=35;i>G;i--)
cout<<i<<'$';
cout<<i;
}
```

i. 35$34$33$32$31$30$
ii. 35$34$33$32$31
iii. 30$31$32$33$34$35$36
iv. 35$34$33$32$31$30

Question II

(a) Raju went to the railway station. He wants to know the arrival details of 'Kerala Express'. He used the touch screen machine and got the information. He wondered how easily he got the information. Explain the OOP concept related to this situation. [2]

(b) Answer the questions (i) and (ii) after going through the class declaration given below.

```
class Cat
{
public:
        Cat();                  //Function 1
        Cat(int itsAge);        //Function 2
```

_____@@_____

```
        Cat(int & Billa)          //Function 3
        Void Meow()               //Function 4
private:
        int itsAge;               //member variable 1
        char itsName[100];        //member variable 2
};
```

(i) Write definition of Function 1, Function 2 and Function3. [1]

(ii) Write statements to execute Function 1, Function 2, Function 3 and Function4. [1]

(c) Define a class 'TravelPlan' with the following descriptions: [4]

Private members:

- PlanCode of type long
- Place of type character array (string)
- Number_of_travelers of type integer
- Number_of_buses of type integer

Public Members

- A constructor to assign initial values of PlanCode as 1001, Place as "Agra", Number of travellers as 5, Number of buses as 1.
- Another constructor to initialize the data members with the help of corresponding values passed as arguments.
- A function 'NewPlan()' which allows the user to enter PlanCode, Place and Number of travelers. Also assign the value of Number of buses as per the conditions given below:

Number of travellers	**Number of buses**
Less than 20	1
Equal or more than 20 but less than 40	2
Equal to or more than 40	3

- A function ShowPlan() to display the content of all the data members on screen.

(d) Consider the class declarations given below and answer the questions from 2d(i) to 2d(iv)

```
struct Gitems{
int no;
char n[20];
float price[5];
};
class Toys{
char Tcode[5];
protected:
        float price[5];
        int Assign( float );
```

_____@@_____

```
public:
        Toys();
        char* Tentry( float[] );
        void Tdisplay(void);
};
class SoftToys{
        char* Stname[20];
        unsigned int W;
public:
        SoftToys();
        Gitems G[4];
        long double Stentry();
        void Stdisplay();
};
class ElectronicToys : public SoftToys, protected Toys{
        short Etname[20];
        int No_of_Batteries;
public:
        unsigned int p;
        ElectronicToys();
        void ETEntry();
        void ETDisplay();
};
void main(){
        ElectronicToys Puppy;
}
```

(i) Name the order of invocation of constructors when an object of class 'ElectronicToys' is created. [1]

(ii) What is the size of 'Puppy'? [1]

(iii) Name the data members that can be accessed inside the member function 'void stdisplay()'. [1]

(iv) If the class 'ElectronicToys' was protectedly derived from the class 'SoftToys' and publically derived from the class 'Toys', name the members that can be accessed using an object of class ElectronicToys'. [1]

Question III

(a) Write a function named 'COMBINE()' to combine the contents of two equi-sized arrays 'a' and 'b' by computing their corresponding elements using

the formula 2 * a[i] + 3 * b[i] where i varies from 0 to (n-1) and transfer the resultant content in to the third same sized array namely 'c'. The arrays a, b, c and the size 'n' should be passed as arguments to the function. [2]

(b) If a two dimensional array A [-15...20, 20...45] is stored as column wise and A [0, 40] is stored at 1735 and A [10, 24] at 1169. Find the address of A [12, 23]. [3]

(c) Consider the structure/class declarations given below.

```
struct Bus
{
    int busno;
    char busName[25];
    Bus* NEXT;
};
class myBuses
{
    Bus *start, *end;
    Public:
        Void insert (int elm, char n1 []);
        //Adds a new element to dynamically allocated queue.
};
```

Complete the definition of the member function. [2]

(d) Write functions to perform PUSH & POP operations in a dynamically allocated stack containing the objects of the following structure: [3]

```
struct NODE
{   char name[30];
    float fees;
    NODE *next;
};
```

(d) Write a function which accepts an integer array and its size as arguments/parameters and assign the elements into a two dimensional array of integers in the following format. [2]

If the array is 1, 2, 3 the output should be as follows.

1	0	0
1	2	0
1	2	3

(e) Convert the infix expression given below to post fix using stack. Show the position of the stack after each step.

(X + Y) / (Z * Y) – R [2]

Question IV

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

```
class Library{
```

_____@@_____

```
long Ano;
char Title[20];
int Qty;
public:
void Enter(int);
void Display();
void Buy(int Tqty)
{
Qty += Tqty;
}
long GetAno( )
{
return Ano;
}
};
void BuyBook(long BAno, int BQty)
{
Fstream File;
File.open("STOCK.DAT",ios::binary|ios::in|ios::out);
int Position=-1;
Library L;
while(Position==-1 && File.read((char*)&L, sizrof(L))
{
if(L.GetAno()==BAno)
{
L.Buy(BQty);
Position = File.tellg()-sizeof(L);
//Statement 1: To place the file
// pointer to required position
_____;
//Statement 2: To write the object 'L' on to the binary file
_____;
}
if( position = = -1 )
```

_____@@_____

```
cout<<"No updation done as Ano not found";
File.close();
}
}
```

(b) Consider a file "DRAMA.TXT" which contains some matter. Write a function named "alpha_frequency()" that calculates and display's the frequency table of alphabets present in the file. [2]

(c) Assuming the class DRINKS defined below, write a function to read the objects of DRINKS from a binary file and display them on the screen when Dname has the value "Pepsi". [3]

```
class DRINKS{
int DCode;
char DName[13];
int Dsize; // size in litres.
float Dprice;
public:
void showdrinks( )
{
cout<<endl<<"Dcode = "<<DCode
<<endl<<"Name of the drink = "<<DName
<<endl<<"Size in litres = "<<Dsize
<<endl<<"Price = "<<Dprice<<'$';
}
char* getname()
{
return Dname;
}
};
```

Question V

(a) Consider the relations 'STUDENT' and 'INSTRUCTOR' given below:

Student

ROLL NO.	NAME	TOTAL MARKS
1	Tom	456
2	Tim	550
3	Jose	600

Instructor

INO	INAME
10	Jim

_____@@_____

20	Sam

Find the Cartesian product of relations 'STUDENT' and 'INSTRUCTOR'. [2]

(b) Consider the tables STUDENT and EVENT. Write SQL statements for questions (i) to (iv) and give outputs for SQL queries (v) to (viii).

STUDENT

Rno	Name	Age	Class	Sex	Dob	Marks
100	Arjun	18	12B	M	27-Oct-88	75
200	Anjana	18	12A	F	28-Jan-88	68
300	Sharath	17	12C	M	16-Jun-89	46
400	Jacob	17	12A	M	14-Oct-90	72
500	Abrar	18	12B	M	17-Jul-89	68
60	Praveen	15	12C	M	15-Nov-87	88
700	Lakshmi	17	12A	F	30-Mar-90	90
800	Ranju	16	12A	F	29-Feb-88	
900	Kartha	18	12B	M	11-Apr-87	77
1000	Jenny	17	12C	F	19-Mar-90	52

EVENT

Rno	**Ename**	**Place**
100	Football	2
400	Athletics	1
600	Badminton	1
900	Football	1
1000	Tennis	3

(i) Display the roll number and name of the student who got first place in 'Badminton'. [1]

(ii) Display the total marks scored by students of class '12A' and also by students of class '12B' separately. [1]

(iii) Display the details of students who were absent for the exam. { A student is considered to be absent for the exam, if he/she does not have a mark entry in the marks column.} [1]

(iv) Display the roll number, name and marks of all the students sorted by marks in descending order keeping the alphabetical order of names. [1]

(v) SELECT COUNT (DISTINCT Marks) FROM Student; [1/2]

(vi) SELECT DISTINCT Age, Class FROM Student; [1/2]

(vii) SELECT Ro, Name FROM Student WHERE Marks BETWEEN 77 AND 90. [1/2]

_____@@_____

(viii) SELECT Rno FROM Student WHERE NOT Name ='Jacob'; [1/2]

Question VI

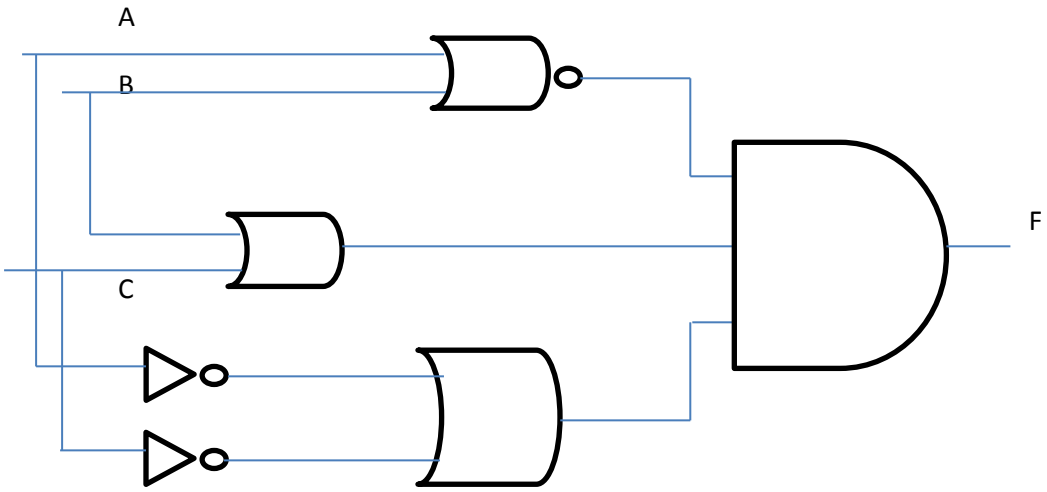
(a) Using the method of algebra, prove the Boolean relations given below:[2]

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

(b) Write the canonical product of sum from the truth table given below: [1]

X	Y	Z	F
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

(c) Write the output of the circuit diagram given below: [1]



(d) State and verify distributive laws of Boolean algebra. [1]

(e) Simplify the Boolean expression given below using the method of Karnaugh-Veitch- diagrams. [3]

F [P, Q, R, S] = π (0, 1, 2, 4, 5, 6, 8, 10)

Question VII

_____@@_____

(a) Define the following: (i) Piconets (ii) GSM. [1]

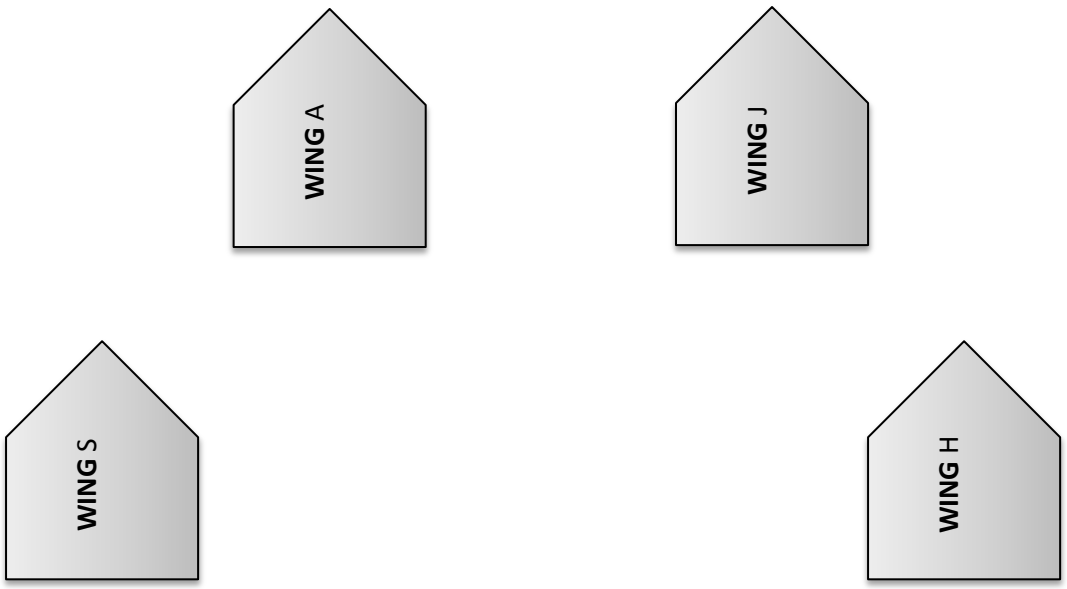
(b) Write the full form of the following [1]

(i) PHP (ii) VIRUS (iii) SMSC (iv) W3C

(c) Write any two disadvantages of 2G technology. What is 4G? [1]

(d) Define spam and Blog. [1]

(e) INDIAN PUBLIC SCHOOL in Darjeeling is setting up the network among its different wings. There are 4 wings named as SENIORS(S), JUNIORS(J), ADMIN(A) and HOSTEL(H) as shown in the diagram given below:



Distance between various wings:

Wing A to Wing S	70m
Wing A to Wing J	200m
Wing S to Wing J	150m
Wing S to Wing H	100m
Wing J to Wing H	450m
Wing A to Wing H	400m

Number of computers

_____@@_____

Wing A	10
Wing S	200
Wing J	100
Wing H	50

(i) Suggest the most suitable cable layout of connections among the wings and technology. [1]

(ii) The school wants to provide and share internet access in and among each of the buildings. How can this be achieved? [1]

(iii) Suggest the placement of the following devices with justification:
(a) Repeater (b) Server [1]

(iv) The school is planning to connect its head office in the closest big city, which is more than 350 km from the school campus. Which type of network out of LAN, MAN or WAN will be formed? Justify your answer. [1]

(f) Write the difference between "Open Source Software" and "Proprietory Software". [1]

(g) What is "Web Scripting"? [1]

Cinil Thomas PGT[cinil_thomas@yahoo.com]
De Paul Public School
Thodupuzha
Kerala

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