

INTERNATIONAL INDIAN SCHOOL, DAMMAM

First Terminal Examination, June 2013

Computer Science – Class XII

Set A

Time: 1 hour

Marks: 70

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1. (a) What is the difference between automatic type conversion and typecasting? (2)
Give suitable examples.

(b) What is the difference between actual parameters and formal parameters in C++? (2)

(c) Write the names of the header files to which the following functions belong: (2)
(i) isalpha() (ii) setw() (iii) gets() (iv) pow()

(d) Rewrite the following program after correcting syntactical errors, if any. (2)
Underline each correction.

```
#include <iostream.h>
void main()
{
    n1=40, n2=30;
    change(n1;n2);
    change(n2);
}
void change(int num1,int num2=20)
{
    num2=num1*num2;
    cout<<num1,num2;
}
```

(e) Find the output of the following program. (Assume that all necessary header files are included). (2)

```
void trans(char txt[],int len)
{
    for(int i=1; i<len; i++)
    {
        if(isupper(txt[i])) txt[i]=tolower(txt[i]);
        else if(islower(txt[i])) txt[i]=toupper(txt[i]);
        else if(isdigit(txt[i])) txt[i]= txt[i-1];
        else txt[i]='$';
    }
}
void main()
{
    char name[]="World Cup 2012";
    int size=strlen(name);
    trans(name,size);
    cout<<name<<"\n";
}
```

- (f) For the following C++ program, choose the possible output(s) from options (i) to (iv) given below: (Assume that all necessary header files are included). (2)

```
void main()
{
    randomize();
    char Area={"NORTH", "SOUTH", "EAST", "WEST"};
    int ToGo;
    for(int i=0;i<3;i++)
    {
        ToGo=Random(2)+i;
        cout<<Area [ToGo]<<" : ";
    }
}
```

Outputs:

- (i) SOUTH:EAST:SOUTH
 - (ii) NORTH:SOUTH:EAST
 - (iii) SOUTH:EAST:WEST
 - (iv) SOUTH:WEST:EAST
- (g) Find the output of the following program: (3)

```
#include <iostream.h>
int var=12;
void func(int &x, int y)
{
    x=x-y;
    y=x*10;
    cout<<x<<' #'<<y<<' \n' ;
}
void main()
{
    int var=8;
    func(::var,var);
    cout<<var<<' #'<<::var<<' \n' ;
    func(var,::var);
    cout<<var<<' #'<<::var<<' \n' ;
}
```

- (h) Rewrite the following program after correcting syntactical errors, if any. (2)
Underline each correction.

```
#include iostream.h
Struct emp
{
    int eno;float sal;
}emp[101,1600];
```

```

void main()
{
    emp e;
    cout<<eno<<sal;
}

```

- (i) Find the output of the following program:

(3)

```

#include <iostream.h>
struct Pixel
{
    int C,R;
};
void Display(Pixel P)
{
    cout<<"Col"<<P.C<<"Row"<<P.R<<endl;
}
void main()
{
    Pixel X={40,50},Y,Z;
    Z=X;
    X.C+=10;
    Y=Z;
    Y.C+=10;
    Y.R+=20;
    Z.C-=15;
    Display(X);
    Display(Y);
    Display(Z);
}

```

2. (a) Define the term function overloading. Illustrate with an example (2)

- (b) Compare Object Oriented Programming with Procedural Programming (Any two points). (2)

- (c) Answer the questions (i) to (iv) after going through the following code: (4)

```

class exam
{
    char name[20];
    int year;

    public:

    exam(int y)    // function 1
    {
        year=y;
    }
}

```

```

    }

    exam(exam &e);    // function 2

    ~exam();           // function 3

    void show()        // function 4
    {
        cout<<"Name: " <<name<<"\n" <<"Year: " <<year;
    }
};

```

(i) Name the phenomenon displayed by function 1 and 2 together.

(ii) Write a statement to create invoke function 1.

(iii) Write the definition for function 2.

(iv) When will function 3 be invoked?

(d) Define a class Applicant in C++ with the following descriptions: (4)

Private members:

- A data member ANo (Admission Number) of type long.
- A data member Name of type string.
- A data member Agg (Aggregate marks) of type float.
- A data member Grade of type char.
- A member function GradeMe() to find the grade as per the aggregate marks as follows:

Aggregate Marks	Grade
>=80	A
less than 80 and >=65	B
less than 65 and >=50	C
less than 50	D

Public members:

- A fuction ENTER() to input the values of ANo, Name, and Agg and invoke the GradeMe() function to calculate grade.
- A function RESULT() which displays the content of all the data members.

(e) Define a class RESTRA in C++ with the following descriptions: (4)

Private members:

- FoodCode of type int
- Food of type string

- FType of type string
- Sticker of type string
- A function GetSticker() which assigns the value of Sticker as follows:

FType	Sticker
Vegetarian	GREEN
Contains Egg	YELLOW
Non-Vegetarian	RED

Public members:

- A fuction GetFood() to input the values of FoodCode, Food, and FType and invoke the GetSticker() function to assign sticker.
- A function ShowFood() which displays the content of all the data members.

(f) Consider the following and answer the questions given below: (4)

```
class University
{
    int NOC;

protected:
    char Uname[25];

public:
    University();
    char State[25];
    void EnterData();
    void DisplayData();
};

class College : public University
{
    int NOD;
    int Cname[25];

protected:
    void Affiliaton();

public:
    College();
    void Enrol(int,int);
    void show();
};

class Department : public College
```

```

{
    char Dname[25];
    int NOF;
public:
    Department();
    void Display();
    void Input();
};

```

- i. Which class' constructor will be called first at the time of declaration of an object of class Department?
- ii. How many bytes does an object belonging to class Department require?
- iii. Name the member function(s) which are accessed from the objects of class Department.
- iv. Name the data member(s) which are accessible from the objects of class College.

(g) Consider the following and answer the questions given below:

(4)

```

class Chairperson
{
    long Cid;
    char Cname[20];
protected:
    char description[40];
    void allocate();
public:
    Chairperson();
    void assign();
    void show();
};

class Director
{
    int Did;
    char Dname[20];
protected:
    char profile[30];
public:
    Director();
    void input();
    void output();
};

class Company: private Chairperson, public Director
{
    int Cid;
    char city[20], country[20];

```

```
public:
    Company();
    void enter();
    void display();
}
```

- (i) Which type of inheritance is illustrated in this code?
 - (ii) Name the data members which can be accessed by an object of class Company.
 - (iii) Name the member functions which can be accessed by an object of class Company.
 - (iv) Name the members which cannot be accessed by objects of class Director.
3. (a) Explain the terms in the context of RDBMS: (4)
 (i) Primary key (ii) Foreign key (iii) Selection (iv) Cardinality
- (b) Consider the following tables: (9)
 Write the SQL commands for the statements (i) to (vi) [6 X 1 = 6 marks]
 and outputs for SQL queries (vii) to (xii) [6 X 1/2 = 3 marks]

Item

I_Id	Itemname	Manufacturer	Price
PC01	Personal Computer	ABC	35000
LC05	Laptop	ABC	55000
PC03	Personal Computer	XYZ	32000
PC06	Personal Computer	COMP	37000
LC03	Laptop	PQR	57000

Customer

C_Id	Customername	City	I_Id
01	N Roy	Delhi	LC03
06	H Singh	Mumbai	PC03
12	R Pandey	Delhi	PC06
15	C Sharma	Delhi	LC03
16	A Agarwal	Bangalore	PC01

- (i) To display the details of those customers whose address is Delhi.
- (ii) To display the details of items whose price is in the range of 35000 to 55000 (both values included).
- (iii) To display the number of customers from each city.

(iv) To display the Customername, City from table Customer and Itemname and price from table Item, with their corresponding matching I_Id.

(v) To increase the price of all items by 1000 in the table Item.

(vi) To delete the row of C Sharma from the Customer table.

(vii) SELECT DISTINCT City FROM Customer;

(viii) SELECT Itemname, MAX(Price) FROM Item GROUP BY Itemname;

(ix) SELECT PRICE FROM Item WHERE Manufacturer='PQR'
|| Itemname='Laptop';

(x) SELECT Cutomername, Manufacturer FROM Item, Customer
WHERE Item.I_Id=Customer.I_Id;

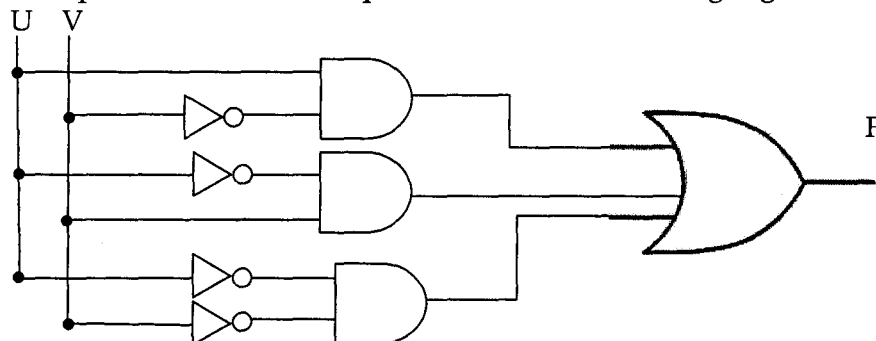
(xi) SELECT Itemname, Price*100 FROM Item WHERE Manufacturer =
'ABC';

(xii) SELECT C_Id FROM Customer WHERE City LIKE "%b%";

4. (a) State Absorption Laws. Verify one of them algebraically. (2)

(b) Draw the Logical circuit diagram for the following Boolean expression using NOR gates only: (2)
 $X \cdot (Y + Z')$

(c) Write the equivalent Boolean expression for the following logic circuit: (2)



(d) Prove algebraically: (2)
 $x'y'z' + x'y'z + xy'z + x'yz' + xy'z' + x'y'z = x' + y'$

(e) Write the equivalent Canonical Sum of Product (SOP) form:
 $F(X,Y,Z) = \pi(1,3,6,7)$

(f) Reduce the following Boolean expression using K-map:
 $F(u,v,w,x) = \sum(0,3,4,5,7,11,13,15)$

(3)