

INTERNATIONAL INDIAN SCHOOL, DAMMAM
FIRST TERMINAL EXAMINATION, JUNE 2014
COMPUTER SCIENCE – CLASS XII
SET A

TIME: 3HRS.
MAX.MARKS:70

1. (a) What is the difference between call by value and call by reference? Give example. (2)
- (b) Differentiate between a Run Time Error and Syntax Error. Also give suitable examples of each in C++. (2)
- (c) Name the header files that should be included to execute the following code. (2)

```
void main()
{
clrscr();
cout<<setw(7)<<4444;
exit(0);
}
```

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

```
#include<iostream.h>
void main()
{
int x[]={60,50,30,40}, y; count=4;
for(i=count-1;i>=0;i--)
{
switch[i]
{
case0:
case 2:cout<<y*x[i]<<endl; break;
case 1:-
case 3:cout<<y+x[i];
}
}
}
```

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

```
#include<iostream.h>
void change(char a[])
{
for(int i=0;a[i]!='\0';i++)
{
if(a[i]>=97 && a[i]<=122)
a[i]--;
else if(a[i]>='0' && a[i]<='9')
a[i]=a[i-1];
else if(a[i]>='A' && a[i]<='Z')
a[i]+=32;
else
a[i]='#';
}
}
```

```

void main()
{
char str[]="FlfA wOrLd-2014";
change(str);
puts(str);
}

```

- (f) For the following C++ program, choose the possible output(s) from options (i) to (iv) given below: (2)

```

#include<iostream.h>
#include<stdlib.h>
void main()
{
int low=10, p=5;
randomize();
for(int i=1;i<=4;++i)
{
cout<<(random(p)+low);
cout<<".";
p--;
}
}

```

Options:

- i. 13:13:12:10: ii. 14:14:11:11
iii. 14:13:11:11: iv. 14:13:13:11:

- (g) Find the output of the following program: (3)

```

#include<iostream.h>
struct colors
{
int x, y, z;
};
void shuffle(colors &Col, int pos=1)
{
Col.x+=pos;
Col.y-=pos;
Col.z*=pos;
}
void display(colors C)
{
cout<<C.x<<" "<<C.y<<" "<<C.z<<endl;
}
void main()
{
colors me={10,20,5}, you;
shuffle(me,2);
display(me);
you=me;
shuffle(you);
display(you);
me=you;
shuffle(me,3);
display(me); }

```

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

```
#include<iostream.h>
void main()
{
    Present=25, Past=35;
    void Assign(int,int);
    Assign(Present; Past);
    Assign(Past);
}
void Assign(int Default1, Default2=30)
{
    Default1=Default1+Default2;
    cout<<Default1>>Default2;
}
```

- (i) Find the output of the following program: (3)

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

2. (a) What do you understand by Polymorphism? Give suitable example of the same. (2)

- (b) How does a class enforce data-hiding and encapsulation? (2)

- (c) Define a class WORKER with the following specification: (4)

Private members:

Wname	25 characters
Hrwrk, wgrate	float(hours worked and wage rate per hour)
Totwage()	float(hrwrk*wgrate)
Calcwg()	a function to find hrwrk*wgrate with float return type

Public members:

In_data()	a function to accept values for wno, wname, hrwrk, wgrate and Invoke calcwg() to calculate totwage.
Out_data()	a function to display all the data members on the screen.

- (d) Define a class TAXPAYER in C++ with the following description: (4)

Private members:

- Name of type string.
- PanNo of type string.

- Taxabincm(taxable income) of type float
- TotTax of type double.
- A member function CompTax() to calculate tax according to the following slab:

Taxable Income	Tax %
Upto 160000	0
>160000 and <=300000	5
>300000 and <=500000	10
>500000	15

Public members:

- A parameterized constructor to initialize all the members.
- A function INTAX() to enter data for the tax payer and call function CompTax() to assign TotTax.
- A function OUTTAX() to allow user to view the contents of all data member.

(e) Answer the questions (i) to (iv) after going through the following code:

(4)

```
class TEST
{
    int time;
public:
    TEST( )           // function1
    {
        Time=0;
    }
    ~TEST( );        // function 2
    void exam( )     // function 3
    {
        cout<<"All the best";
    }
    TEST(int Duration) // function 4
    {
        time=Duration;
    }
    TEST(TEST &T);   // function 5
};
```

- In Object Oriented Programming what is function 1 referred as and when does it get invoked?
- In Object Oriented Programming what is function 2 referred as and when does it get invoked?
- Which category of constructors does function 5 belong to and write the function definition?
- Write statements to invoke function 1 and function 4.

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

(4)

```
class NATION
{
    int H;
protected:
    int S;
public:
    void INPUT( );
    void OUTPUT( );
```

```

class WORLD : private NATION
{
    int T;
    protected:
    int U;
    public:
    void INDATA(int, int);
    void OUTDATA( );
};
class STATE : public WORLD
{
    int M;
    public:
    void DISPLAY(void);
};

```

- (i) Name the base class and derived class of the class WORLD.
- (ii) Name the data member(s) that be accessed from function DISPLAY();
- (iii) Name the member function(s) which can be accessed from objects of class STATE.
- (iv) Is the member function OUTPUT() accessible by the objects of class WORLD.

(g) Answer the questions (i) to (iv) based on the following code:

(4)

```

class Teacher
{
    char TNo[5], TName[20], Dept[10];
    int Workload;
    protected:
    float Salary;
    void AssignSal(float);
    public:
    Teacher( );
    void TEntry( );
    void TDisplay( );
};
class Student
{
    char Admno[10], SName[20], Stream[10];
    protected:
    Int Attendance, TotMarks;
    public:
    Student( );
    void Sentry( );
    void SDisplay( );
};
class School : public Student, public Teacher
{
    char SCode[10], SchName[20];
    public:
    School( );
    void SchEntry( );
    void SchDisplay( );
};

```

- (i) Define the type of inheritance depicted in the above example.
- (ii) Identify the member function(s) that cannot be directly accessed from the objects of class School from the following:
TEntry()
SDisplay()
AssignSal(float)
- (iii) Write name of all the data member(s) accessible from member functions of class School.
- (iv) If class School was derived privately from class Teacher and privately from class Student, then, name the member function(s) that could be accessed through objects of class School.

3. (a) Differentiate between Candidate Key and Alternate Key in context of RDBMS. (2)
- (b) Consider the following tables SCHOOL and ADMIN. Write SQL commands for the statements (i) to (vii) and outputs for SQL queries (viii) to (xiii). (7)

SCHOOL

CODE	TEACHERNAME	SUBJECT	DOJ	PERIODS	EXPERIENCE
1001	Ravi Shankar	English	12/03/2000	24	10
1009	Priya Rai	Physics	03/09/1998	26	12
1203	Lisa Anand	English	09/04/2000	27	5
1045	Yashraj	Maths	24/08/2000	24	15
1123	Ganan	Physics	16/07/1999	28	3
1167	Harish	Chemistry	19/10/1999	27	5
1215	Umesh	Physics	11/05/1998	22	16

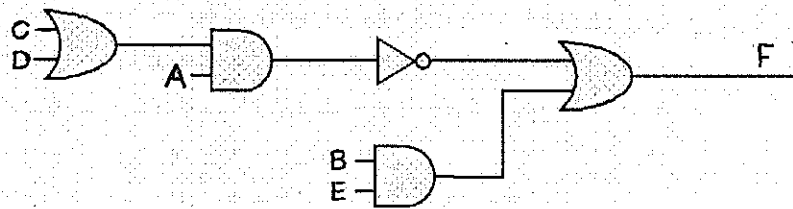
ADMIN

CODE	GENDER	DESIGNATION
1001	Male	Vice Principal
1009	Female	Coordinator
1203	Female	Coordinator
1045	Male	HOD
1123	Male	Senior Teacher
1167	Male	Senior Teacher
1215	Male	HOD

- (i) To display teacher name and periods of teachers who are having periods less than 25.
- (ii) To display the name, code and designation of male teachers.
- (iii) To display the number of teachers subject wise.
- (iv) To display the code, name and subjects of all teachers who have joined after 01/01/1999.
- (v) To display the details of teachers having periods in the range 22 to 26(both values included).
- (vi) Add a new tuple of a male candidate with code 1225 and designation as Head Master.
- (vii) To erase all the records of English teachers.
- (viii) SELECT MAX(EXPERIENCE), MIN(EXPERIENCE) FROM SCHOOL;
- (ix) SELECT COUNT(DISTINCT SUBJECT) FROM SCHOOL;

- (x) SELECT DESIGNATION, COUNT(*) FROM ADMIN GROUP BY DESIGNATION HAVING COUNT(*)<2.
- (xi) SELECT CODE FROM SCHOOL WHERE TEACHERNAME LIKE "_a%";
- (xii) SELECT AVG(EXPERIENCE) FROM SCHOOL WHERE PERIODS IN(22,26,28);
- (xiii) SELECT TEACHERNAME, GENDER FROM SCHOOL, ADMIN WHERE DESIGNATION='COORDINATOR' AND SCHOOL.CODE=ADMIN.CODE;

4. (a) State De Morgan's Theorems and verify any one of them using truth table. (2)
- (b) Convert the following Boolean expression into its equivalent Canonical Product of Sum form: (2)
 $X.Y.Z + X'.Y.Z + X'.Y.Z'$
- (c) Write the equivalent Boolean Expression for the following circuit diagram: (2)



- (d) Write the dual of $(A+BC'+AB)$ (1)
- (e) Prove $(x+y)(x+z) = x + yz$ algebraically. (2)
- (f) Draw a logical circuit diagram for the following Boolean expression: (2)
 $(A'+B) + (B.C')$
- (g) Obtain the minimal form for the following Boolean expression using Karnaugh's Map. (3)
 $F(P,Q,R,S)=\pi(0,1,4,5,6,7,11,12,13,14,15)$
