(CLASSES AND OBJECTS SOLUTION)

(MADE BY ALI AKBER)

(BSCS 2ND SS1)

Question 1 :

Write a program that declared a class with one integer data member and two member functions for input data and output data. Decide appropriate access modifiers for these members. Use this class in your program.

```
#include <iostream>

using namespace std;

class thisclass{

        private:

                int no;

                public:

                        void getdata(){

                                cout<<"Enter number:"<<endl;

                                cin>>no;

                        }

                void showdata(){

                        cout<<"Data is: "<<no<<endl;

                }

};

int main (){

thisclass c1;

c1.getdata();

c1.showdata();

return 0;
```

}

Question 2:

Create a class named Distance that has feets (as int) and inches (as float). The class has Getdist (int, float) to get the specified value in object, Showdist () to display distance object in feets' inches" format. Write main() function to create two distance objects. Get the value in two objects and display all objects.

```
#include <iostream>

using namespace std;

class Distance{

        private:

        int feet;

        float inches;

        public:

                void Getdist(int f,float in){

                        feet=f;

                        inches=in;

                }

                void Showdist(){

                        cout<<"The distance is "<<feet<<" feets and "<<inches<<" inches"<<endl;

                }

};


int main (){

Distance d1,d2;

d1.Getdist(12,23.8);

d1.Showdist();

d2.Getdist(32,53.8);
```

```
d2.Showdist();

return 0;

}
```

Question 3 :

Create a class named TIME that has hours, minutes and seconds data members as integer. The class has settime (int, int, int) to set the specified value in object,showtime () to display time object in hh:mm:ss format. Write main () function to create two time objects. Set the value in two objects and display all time objects.

```
#include <iostream>

using namespace std;

class TIME{

        private:

                int hours;

                int minutes;

                int seconds;

                public:

                        void settime(int h,int m,int s){

                                hours=h;

                                minutes=m;

                                seconds=s;

                        }

                        void showtime(){

                                cout<<"The time is "<<hours<<":"<<minutes<<":"<<seconds<<endl;

                        }

};


int main (){
```

```
TIME t1,t2;

t1.settime(12,34,45);

t1.showtime();


t2.settime(07,14,25);

t2.showtime();

return 0;

}
```

Question 4:

Create a class Person that has three data members Pid, Pname, PSalary with appropriate data type. Person class also contains the member functions: getdata() function is used to input values, showdata() function is used to display value, setdata() function is used to set the values of data members using parameters, getSalary() function is used to return the value of person salary. The program should create three objects of the person class and input values for these objects. The program display the details of highest salary holder person.

```
#include <iostream>

#include <string.h>

using namespace std;

class Person{

        private:

                int Pid;

                char Pname[50];

                float Psalary;

                public:

                void getdata(){

                        cout<<"Enter person id; "<<endl;
```

```
                cin>>Pid;
                        cout<<"Enter person name; "<<endl;
                cin.ignore();
                cin.getline(Pname,50);
                        cout<<"Enter person salary; "<<endl;
                cin>>Psalary;
        }
        void showdata(){
                cout<<"The person id is: "<<Pid<<endl;
                cout<<"The person name is: "<<Pname<<endl;
                cout<<"The person salary is: "<<Psalary<<endl;
        }
        void setdata(int x, char name[],float z){
                Pid=x;
                strcpy(  Pname,name);
                                                Psalary=z;
        }
        float getsalary(){
                return Psalary;
        }
};

int main (){
Person p1,p2,p3;
p1.getdata();
p2.setdata(12,"RAJAB",15000);
```

```
p3.getdata();


if (p1.getsalary()>p2.getsalary() && p1.getsalary()>p3.getsalary()){
        cout<<"Person 1 has highest salary "<<endl;
        p1.showdata();
}
if (p2.getsalary()>p1.getsalary() && p2.getsalary()>p3.getsalary()){
        cout<<"Person 2 has highest salary "<<endl;
        p2.showdata();
}
if (p3.getsalary()>p1.getsalary() && p3.getsalary()>p1.getsalary()){
        cout<<"Person 3 has highest salary "<<endl;
        p3.showdata();
}
return 0;
}
```

Question 5:

Write a class Employee with three data members Eid type int, Ename type string and Esalary type double. It also contains the following member function:The get() function is used to input values The show() function is used to display values The set() function is used to set the values of data members using parameters.The returnSalary() function is used to return the salary of employee. The program should create two object of the employee class, input the values and display the record of that employee whose monthly salary is greater.

```
#include <iostream>
#include <string.h>
using namespace std;
class Empolyee{
```

```
        int Eid;
        char Ename[50];
        double Esalary;
        public:
                void getdata(){
                        cout<<"Enter empolyee id: "<<endl;
                        cin>>Eid;
                        cout<<"Enter empolyee name: "<<endl;
                        cin.ignore();
                        cin.getline(Ename,50);
                        cout<<"Enter empolyee salary: "<<endl;
                        cin>>Esalary;
                }
                void showdata(){
                        cout<<"Empolyee with highest salary is: "<<endl;
            cout<<"The empolyee id is: "<<Eid<<endl;
            cout<<"The empolyee name is: "<<Ename<<endl;
              cout<<"The empolyee salary is: "<<Esalary<<endl;
            }
            void setdata(int x,char name[], double y){
                    Eid=x;
strcpy(Ename,name);
                    Esalary=y;
            }
            double returnSalary(){
                    return Esalary;
```

```
        }
};
int main (){
    Empolyee e1,e2;
cout<<"Empolyee 1 details is: "<<endl;
e1.getdata();

e2.setdata(2,"AHMAD ALI",24000);
if(e1.returnSalary()>e2.returnSalary())
e1.showdata();
else
e2.showdata();
return 0;
}
```

Question 6:

Write a program that declare a class Student with five data members to store five subject mark of student. Class also includes three member function for input marks,Sum() to calculate and return the sum of five subject and Avg() to calculate and return the average marks of five subject. Each subject has a maximum of 100 marks. Use this class in your program.

```
#include <iostream>
#include <string.h>
using namespace std;
class Student{
    private:
        float eng,math,science,urdu,physics,total,average;
        float sum(){
```

```
        total=eng+math+science+urdu+physics;
        return total;
}
float Avg(){
        float sum;
            sum=eng+math+science+urdu+physics;
            float average;
            average=sum/5.0f;
            return average;
}
public:
        void inputmarks(){
            cout<<"Enter student marks in Subject 1:"<<endl;
            cin>>eng;
            cout<<"Enter student marks in    Subject 2:"<<endl;
            cin>>math;
            cout<<"Enter student marks in Subject 3:"<<endl;
            cin>>science;
              cout<<"Enter student marks in Subject 4:"<<endl;
            cin>>urdu;
              cout<<"Enter student marks in Subject 5:"<<endl;
            cin>>physics;
            total=sum();
            average=Avg();
        }
        void showdata(){
```

```
                cout<<"Student details is as follows:"<<endl;
            cout<<" Student marks in Subject 1:"<<eng<<endl;
            cout<<" Student marks in Subject 2:"<<math<<endl;
            cout<<" Sudent marks in Subject 3:"<<science<<endl;
            cout<<" Sudent marks in Subject 4:"<<urdu<<endl;
            cout<<" Sudent marks in Subject 5:"<<physics<<endl;
                cout<<" Student total marks in subjects are:"<<total<<endl;
                cout<<" Student average marks in subjects are:"<<Avg()<<endl;
        }
};

int main (){
Student s;
s.inputmarks();
s.showdata();
return 0;
}
```

Question 7:

Define a class student with the following specification

Private members of class student

admno integer

sname 20 character

eng. math, science float

total float

ctotal() a function to calculate eng + math + science with float return type.

Public member function of class student

Takedata() science

Function to accept values for admno, sname, eng,

Showdata()

and invoke ctotal() to calculate total. Function to display all the data members on the screen.

```
#include <iostream>
#include <string.h>
using namespace std;
class Student{
        private:
                int admno;;
                char sname[20];
                float eng,math,science;
                float total;
                float ctotal(){
                        total=eng+math+science;
                        return total;
                }
                public:
                        void takedata(){
                            cout<<"Enter student admission number:"<<endl;
                            cin>>admno;
                        cout<<"Enter student name:"<<endl;
                        cin.ignore();
                        cin.getline(sname,20);
```

```
        cout<<"Enter student marks in english:"<<endl;
        cin>>eng;
        cout<<"Enter student marks in    math:"<<endl;
        cin>>math;
        cout<<"Enter student marks in science:"<<endl;
        cin>>science;
        total=ctotal();
    }
    void showdata(){
        cout<<"Student details is as follows:"<<endl;
        cout<<" Student admission number:"<<admno<<endl;
        cout<<" Student name:"<<sname<<endl;
        cout<<" Student marks in english:"<<eng<<endl;
        cout<<" Student marks in    math:"<<math<<endl;
        cout<<" Sudent marks in science:"<<science<<endl;
        cout<<" Student total marks in subjects are:"    <<total<<endl;
    }
};

int main (){
Student s;
s.takedata();
s.showdata();
return 0;
}
```

Question 8:

Define a class batsman with the following specifications: Private members:

bcode 4 digits code number

bname 20 characters

innings, notout, runs integer type

batavg it is calculated according to the formula batavg =runs/(innings-notout)

calcavg() Function to compute batavg

Public members:

readdata() Function to accept value from bcode, name, innings, notout and invoke the function calcavg()

displaydata() Function to display the data members on the screen.

```
#include <iostream>
#include <string.h>
using namespace std;
class Batsman{
        private:
                int bcode;
                char bname[20];
                int innings,notout,runs;
                float batavg;
                float calcavg(){
                        if (innings !=notout){
                                batavg=(runs)/(innings-notout);
                return batavg;
                        }
                else {
```

```
                batavg=0;
        }
return batavg;
        }

        public:
                void readdata(){
                    cout<<"Enter batsman code number:"<<endl;
                    cin>>bcode;
                cout<<"Enter batsman name:"<<endl;
                cin.ignore();
                cin.getline(bname,20);
                cout<<"Enter batsman innings :"<<endl;
                cin>>innings;
                cout<<"Enter batsman is notout:"<<endl;
                cin>>notout;
                cout<<"Enter batsman runs:"<<endl;
                cin>>runs;
                batavg = calcavg();
                }
                void showdat(){
                    cout<<"Batsman details is as follows:"<<endl;
                    cout<<" Batsman code number:"<<bcode<<endl;
                cout<<" Batsman name:"<<bname<<endl;
                cout<<" Batsman innings:"<<innings<<endl;
                cout<<" Batsman not-out:"<<notout<<endl;
```

```
                cout<<" Batsman runs :"<<runs<<endl;
                    cout<<" Batsman average :"       <<batavg<<endl;
                }
};

int main (){
Batsman b;
b.readdata();
b.showdat();
return 0;
}
```

Question 9:

Define a class TEST in C++ with following description:

Private Members

TestCode of type integer

Description of type string

NoCandidate of type integer

CenterReqd (number of centers required) of type integer

A member function CALCNTR() to calculate and return the number of centers as

(NoCandidates/100+1)

Public Members

- A function SCHEDULE() to allow user to enter values for TestCode, Description, NoCandidate & call function CALCNTR() to calculate the number of Centres -

A function DISPTEST() to allow user to view the content of all the data members.

```
#include <iostream>
```

```
#include <string.h>
using namespace std;
class TEST{
        private:
                int testcode;
                string description;
                int nocandidate;
                int centerreqd;
                int CALCNTR(){
                return (nocandidate/100+1);
                }
                public:
                        void SCHEDULE(){
                                cout<<"Enter test code: "<<endl;
                                cin>>testcode;
                                cout<<"Enter description : "<<endl;
                                cin.ignore();
                                getline(cin,description);
                                cout<<"Enter no of candidate : "<<endl;
                                cin>>nocandidate;
                                centerreqd=CALCNTR();
                        }
                                void DISPTEST(){
                                        cout<<"Test code is: "<<testcode<<endl;
                                        cout<<"description is: "<<description<<endl;
                                        cout<<"No of candidate    is: "<<nocandidate<<endl;
```

```
                                        cout<<"Number of centers    is: "<<CALCNTR()<<endl;


                                    }
};
int main (){
TEST t;
t.SCHEDULE();
t.DISPTEST();
return 0;
}
```

Question 10:

Define a class Flight in C++ with following description:

Private Members

A data member Flight number of type integer

A data member Destination of type string

A data member Distance of type float

A data member Fuel of type float

A member function CALFUEL() to calculate the value of Fuel as per the following criteria

Distance	Fuel
<=1000	500
more than 1000 and <=2000	1100
more than 2000 Public Members	2200

A function FEEDINFO() to allow user to enter values for Flight Number, Destination, Distance & call function CALFUEL() to calculate the quantity of Fuel.

A function SHOWINFO() to allow user to view the content of all the data members.

```
#include <iostream>
#include <string.h>
using namespace std;
class Flight{
	private:
		int FlightNumber;
		char destination[50];
		float distance;
		float fuel;
		float CALFUEL(){
			if (distance<=1000){
				fuel=500;
			}
			else if(distance>1000 && distance<=2000){
				fuel=1100;
			}
			else{
				fuel=2200;
			}
			return fuel;
		}
		public:
			void FEEDINFO(){
				cout<<"Enter flight number: "<<endl;
				cin>>FlightNumber;
				cout<<"Enter flight destination: "<<endl;
```

```
                cin.ignore();
                cin.getline(destination,50);
                cout<<"Enter flight distance: "<<endl;
                        cin>>distance;
                        fuel=CALFUEL();
                }
                void SHOWINFO(){
                        cout<<"Flight number is: "<<FlightNumber<<endl;
                        cout<<"Flight destination is: "<<destination<<endl;
                        cout<<"Flight distance is: "<<distance<<endl;
                        cout<<"Flight fuel used is: "<<fuel<<endl;

                }
};

int main (){
Flight f;
f.FEEDINFO();
f.SHOWINFO();
return 0;
}
```

Question 11:

Define a class BOOK with the following specifications:

Private members of the class BOOK are

BOOK NO integer type

BOOKTITLE 20 characters

PRICE **float (price per copy)**

TOTAL COST() **A function to calculate the total cost for N number of copies where N is passed to the function as argument.**

Public members of the class BOOK are

INPUT () **function to read BOOK NO. BOOKTITLE, PRICE**

PURCHASE () **function to ask the user to input the number of copies to be purchased. It invokes TOTAL COST() and prints the total cost to be paid by the user.**

Note: You are also required to give detailed function definitions.

```
#include<iostream>
#include<string.h>
using namespace std;
class BOOK{
        private :
                int BOOKNO;
                char BOOKTITLE[25];
                float PRICE;
        int TOTAL_COST(int N){
                int totalcost= N*PRICE;
                return totalcost;
                }
                public:
                        void INPUT(){
                                cout<<"Enter Book No: "<<endl;
                                cin>>BOOKNO;
                                cout<<"Enter BOOk Title: "<<endl;
                                cin.ignore();
```

```
                cin.getline(BOOKTITLE,25);
                cout<<"Enter Price of Book: "<<endl;
                cin>>PRICE;
            }int PURCHASE(){
            int copies;
        cout << "Enter the number of copies to purchase: ";
        cin >> copies;
        int bill=TOTAL_COST(copies);
        cout << "Total cost to be paid: " << bill << endl;
                }
};
int main (){
BOOK b;
b.INPUT();
b.PURCHASE();
      return 0;
}
```

Question 12:

Define a class REPORT with the following specification:

Private members :

adno 4 digit admission number

name 20 characters

an array of 5 floating point values marks

average average marks obtained

GETAVG() a function to compute the average obtained in five subject Public members:

READINFO() function to accept values for adno, name, marks.

Invoke the function GETAVG()

DISPLAYINFO () function to display all data members of report on the screen.

You should give function definitions.

```
#include<iostream>
#include<string.h>
using namespace std;
class REPORT{
        private:
                int adno;
                char name[20];
                float marks[5];
                float average;
                void GETAVG(){
                        int sum=0;
                        for (int i=0; i<5; i++){
                                        sum=sum+marks[i];
                        }
                average=sum/5.0f;
                }
                public:
                        void READINFO(){
                                cout<<"Enter student admission number:"<<endl;
                        cin>>adno;
```

```
                cout<<"Enter student name:"<<endl;
                cin.ignore();
                cin.getline(name,20);
                for (int i=0 ; i<5; i++){
                        cout<<"Enter marks in subject:"<<i+1<<" ";
                        cin>>marks[i];
                }
        GETAVG();
                }
        void DISPLAYINFO(){
                cout<<"Admission number of student is: "<<adno<<endl;
                cout<<"Name of the student is:"<<name<<endl;
                cout<<"Average marks of student is: "<<average<<endl;
        }
};
int main (){
REPORT r;
r.READINFO();
r.DISPLAYINFO();
        return 0;
}
```

THE END.