1)Semester exam mark calculation inheritance and interface

Program:

```
import java.util.*;
interface grade
{
  int S=10,A=9,B=8,C=7,D=6,E=5,p=4,U=0,ab=0,w=0,i=0;
}
class semmarks implements grade
{
  /*int m1,m2,m3,m4,m5,m6;
semmarks(int m1,int m2,int m3,int m4,int m5,int m6)
  {
    m1=m1;m2=m2;m3=m3;m4=m4;m5=m5;m6=m6;
  }*/
void calculate(int a[],int n)
  {
    for(int i=0;i<n;i++)
    {
      if(a[i]>=90)
          a[i]=10;
      else if(a[i]>=80)
          a[i]=9;
      else if(a[i]>=70)
           a[i]=8;
      else if(a[i]>=60)
          a[i]=7;
      else if(a[i]>=50)
          a[i]=6;
      else if(a[i]>=40)
           a[i]=5;
      else
         a[i]=0;
     }
     float gpa=(1*a[0]+3*a[1]+3*a[2]+4*a[3]+5*a[4]+5*a[5])/(21);
System.out.println("your gpa is: " + gpa);
   }
}
class Semcala
{
  public static void main(String args[])
 {
  int a[]=new int[6];
System.out.println("enter the credit wise subjects starting from 1");
```

```
  Scanner s=new Scanner(System.in);
  for(int i=0;i<6;i++)
  {
    a[i]=s.nextInt();
  }
semmarkssm=new semmarks();
sm.calculate(a,6);
 }
}
```

Output:

```
C:\Users\mhite\Documents\java programing\java>javac Semcala.java

C:\Users\mhite\Documents\java programing\java>java Semcala
enter the credit wise subjects starting from 1
48
67
56
65
76
67
your gpa is: 7.0
```

2)Area calculation using interface

Program:

```
interface Figure
{
double pi=3.14;
float area1();
}
class circle implements Figure
{
float r;
double area;
{
r=20;
}
public float area1()
{
area=pi*r*r;
System.out.println("Area of circle"+area);
return 0;
```

```
}
}
class triangle implements Figure
{
float l;
float h;
float area;
{
l=10;
h=20;
}
public float area1()
{
area=l*h/2;
System.out.println("Area of triangle"+area);
return 0;
}
}
class rectangle implements Figure
{
float l;
float b;
float area;
{
l=10;
b=20;
}
public float area1()
{
area=l*b;
System.out.println("Area of rectangle"+area);
return 0;
}
}
class Testareass
{
public static void main(String args[])
{
circle c=new circle();
rectangle r=new rectangle();
triangle t=new triangle();
Figure f;
f=c;
f.area1();
```

```
f=r;
f.area1();
f=t;
f.area1();
}
}
```

Output

C:\Users\mhite\Documents\java programing\java>javac Testareass.java

C:\Users\mhite\Documents\java programing\java>java Testareass

Area of circle1256.0

Area of rectangle200.0

Area of triangle100.0

3)write a program to perform string operations using array list

Program:

```
import java.util.*;
import java.io.*;
public class Arraylistexample1
{
public static void main(String args[]) throws IOException
{
ArrayList<String> obj = new ArrayList<String>();
DataInputStream in=new DataInputStream(System.in);
int c,ch;
int i,j;
String str,str1;
do
{
System.out.println("STRING MANIPULATION");
System.out.println("************************");
System.out.println("1. Append at end \t 2.Insert at particular index \t 3.Search \t");
System.out.println("4. List string that starting with letter \t");
System.out.println("5. Size \t 6.Remove \t 7.Sort \t 8.Display\t" );
System.out.println("Enter the choice ");
c=Integer.parseInt(in.readLine());
switch(c)
 {
 case 1:
```

```
 {
System.out.println("Enter the string ");
 str=in.readLine();
obj.add(str);
 break;
 }
case 2:
{
System.out.println("Enter the string ");
str=in.readLine();
System.out.println("Specify the index/position to insert");
i=Integer.parseInt(in.readLine());
obj.add(i-1,str);
System.out.println("The array list has following elements:"+obj);
break;
}
case 3:
{
System.out.println("Enter the string to search ");
str=in.readLine();
j=obj.indexOf(str);
if(j==-1)
System.out.println("Element not found");
else
System.out.println("Index of:"+str+"is"+j);
break;
}
case 4:
{
System.out.println("Enter the character to List string that starts with specified
character");
str=in.readLine();
for(i=0;i<(obj.size()-1);i++)
{
str1=obj.get(i);
if(str1.startsWith(str))
{
System.out.println(str1);
}
}
break;
}
case 5:
{
```

```
System.out.println("Size of the list "+obj.size());
break;
}
case 6:
{
System.out.println("Enter the element to remove");
str=in.readLine();
if(obj.remove(str))
{
System.out.println("Element Removed"+str);
}
else
{
System.out.println("Element not present");
}
 break;
}
 case 7:
{
Collections.sort(obj);
System.out.println("The array list has following elements:"+obj);
break;
}
case 8:
{
System.out.println("The array list has following elements:"+obj);
 break;
}
}
System.out.println("Please Enter 0 to break and 1 to continue");
ch=Integer.parseInt(in.readLine());
}while(ch==1);
 }
}
```

Output:

```
C:\Users\mhite\Documents\java programing\java>javac Testareass.java

C:\Users\mhite\Documents\java programing\java>java Testareass
STRING MANIPULATION
**********************
1. Append at end        2.Insert at particular index    3.Search
4. List string that starting with letter
5. Size         6.Remove        7.Sort          8.Display
```

```
Enter the choice
1
Enter the string
I
Please Enter 0 to break and 1 to continue
0
```

4) ADT stack

Program:

```
import java.io.*;
interface Stackoperation
{
  public void push(int i);
  public void pop();
}
class Astack implements Stackoperation
{
 int stack[]=new int[5];
 int top=-1;
 int i;
 public void push(int item)
 {
 if(top>=4)
 {
System.out.println("Overflow");
 }
else
{
 top=top+1;
 stack[top]=item;
System.out.print("Element pushed: "+stack[top]);
 }
 }
 public void pop()
 {
 if(top<0)
System.out.println("Underflow");
 else
 {
System.out.print("Element popped: "+stack[top]);
 top=top-1;
```

```
}
}
public void display() { if(top<0) System.out.println("No Element in stack"); else
{ for(i=0;i<=top;i++) System.out.println("Element:"+stack[i]); } }
}
class Testa
 {
 public static void main(String args[])
 throws IOException
 {
int ch,c;
 int i;
Astack s=new Astack();
DataInputStream in=new DataInputStream(System.in);
 do
{
  try
   {
System.out.println("ARRAY STACK");
System.out.println("1.Push  2.Pop  3.Display  4.Exit");
System.out.print("Enter your Choice:");
ch=Integer.parseInt(in.readLine());
 switch(ch)
{
case 1: System.out.print("Enter the value to push:");
i=Integer.parseInt(in.readLine());
s.push(i);
 break;
case 2: s.pop();
 break;
 case 3: System.out.println("The elements are: ");
s.display();
 break;
 default:
 break;
 }
   }
  catch(IOException e)
 {
System.out.println("IO Error");
   }
System.out.println("Please enter 0 to quit and  1 to continue ");
 c=Integer.parseInt(in.readLine());
 }
```

```
while(c==1);
 }
 }
```

Output:

```
C:\Users\mhite\Documents\java programing\java>javac Testa.java

C:\Users\mhite\Documents\java programing java>java Testa
ARRAY STACK
1.Push  2.Pop  3.Display  4.Exit
Enter your Choice:1
Enter the value to push:1
Element pushed: 1Please enter 0 to quit and  1 to continue
0
```

5) Areas

Program:

```
abstract class Shape
{
	public int length=10;
	public int breadth=20;
	abstract void area();
}
class Rectangle extends Shape
{
	void area()
	{
		int area = length*breadth;
		System.out.println("Area of Rectangle:"+area);
	}
}
class Triangle extends Shape
{
	void area()
	{
		int area = length*breadth/2;
		System.out.println("Area of Triangle :"+area);
	}
}
class Cricle extends Shape
{
	void area()
	{
		float area = 3.14f * length * length;
```

```
                System.out.println("Area of circle:"+ area);
        }
}
class Areas
{
        public static void main(String arg[])
        {
                Rectangle r = new Rectangle();
                r.area();
                Triangle t = new Triangle();
                t.area();
                Cricle c = new Cricle();
                c.area();
        }
}
```

Output:

```
C:\Users\mhite\Documents\java programing\java>javac Areas.java

C:\Users\mhite\Documents\java programing java>java Areas

Area of Rectangle:200
Area of Triangle :100
Area of circle:314.0
```

6)program to calculate area of different figures using interfaces

```
interface Figure
{
double pi=3.14;
float area1();
}
class circle implements Figure
{
float r;
double area;
{
r=20;
}
public float area1()
{
area=pi*r*r;
System.out.println("Area of circle"+area);
return 0;}
}
```

```
class triangle implements Figure
{
float l;
float h;
float area;
{
l=10;
h=20;
}
public float area1()
{
area=l*h/2;
System.out.println("Area of triangle"+area);
return 0;}
}
class rectangle implements Figure
{
float l;
float b;
float area;
{
l=10;
b=20;
}
public float area1()
{
area=l*b;
System.out.println("Area of rectangle"+area);
return 0;}
}
class Testareass
{
public static void main(String args[])
{
circle c=new circle();
rectangle r=new rectangle();
triangle t=new triangle();
Figure f;
f=c;
f.area1();
f=r;
f.area1();
f=t;
f.area1();}
```

}

Output:

```
C:\Users\mhite\Documents\java programing\java>javac Testareass.java

C:\Users\mhite\Documents\java programing java>java Testareass


Area of rectangle200.0
Area of triangle100.0
```