Part A

1) Arithmetic Overloading

```
package JP;
import java.util.Scanner;
public class Arithmeticoveload {
public static void main(String[] args) {
int a,b,c;
System.out.println("enter 3 values");
Scanner sc=new Scanner(System.in);
a=sc.nextInt();
b=sc.nextInt();
c=sc.nextInt();
int result1 = a + b * c;
int result2 = a / (b * c);
int result3 = a % (b + c);
System.out.println("without overriding");
System.out.println("Result 1: " + result1);
System.out.println("Result 2: " + result2);
System.out.println("Result 3: " + result3);
CustomInt aObj = new CustomInt(a);
CustomInt bObj = new CustomInt(b);
CustomInt cObj = new CustomInt(c);
System.out.println("with overriding");
CustomInt result4 = aObj.add(bObj).multiply(cObj);
CustomInt result5 = aObj.divide(bObj).multiply(cObj);
CustomInt result6 = aObj.modulo(bObj).add(cObj);
System.out.println("Result 4: " +result4.getValue());
System.out.println("Result 5: " +result5.getValue());
System.out.println("Result 6: " +result6.getValue());
sc.close();
}
}
class CustomInt {
private int value;
public CustomInt(int value) {
this.value = value;
}
public int getValue() {
return this.value;
}
public CustomInt add(CustomInt other) {
int newValue = this.value + other.value;
return new CustomInt(newValue);
}
public CustomInt subtract(CustomInt other) {
int newValue = this.value - other.value;
return new CustomInt(newValue);
}
public CustomInt multiply(CustomInt other) {
int newValue = this.value * other.value;
return new CustomInt(newValue);
}
public CustomInt divide(CustomInt other) {
int newValue = this.value / other.value;
return new CustomInt(newValue);
```

```
}
public CustomInt modulo(CustomInt other) {
int newValue = this.value % other.value;
return new CustomInt(newValue);
}
}
```

2) Dd/mm/yy

```
package JP;
import java.text.DateFormat;
import java.text.SimpleDateFormat;
import java.util.Scanner;
public class DateValid {
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
System.out.println("Enter a date in dd/mm/yyyy format");
String date = sc.next();
if(dateValidation(date)==true)
System.out.println("Date is valid");
else
System.out.println("Date is invalid");
}
private static boolean dateValidation(String date)
{
boolean status = false;
if (checkDate(date)) {
DateFormat dateFormat = new
SimpleDateFormat("dd/MM/yyyy");
dateFormat.setLenient(false);
try {
dateFormat.parse(date);
status = true;
} catch (Exception e) {
status = false;
}
}
return status;
}
static boolean checkDate(String date) {
String pattern = "(0?[1-9]|[12][0-9]|3[01])\\/(0?[1-9]|[0-2])\\/([0-9]{4})";
boolean flag = false;
if (date.matches(pattern)) {
flag = true;
}
return flag;
}
}
```

3) Pattern

```
package JP;

public class pattern1 {

public static void main(String[] args)
{
int r,c;
```

```
for(r=1;r<=5;r++)
{
for(c=4;c>=r;c--)
{
System.out.print(" ");
}
for(c=1;c<=r;c++)
{
System.out.print(r+" ");
}
System.out.println();
}

}

}
```

4) FIbonacci

```
package JP;

import java.util.Scanner;

public class fib {

public static void main(String[] args)
{
int n,f1=0,f2=1;
System.out.println("Fibbonacci series till n");
System.out.println("Enter the value for n");
Scanner sc =new Scanner (System.in);
n=sc.nextInt();
for (int i=1;i<=n;++i)
{
System.out.print(f1+" \n ");
int f3=f1+f2;
f1=f2;
f2=f3;
}

}
}
```

5) Multipli

```
package JP;

import java.util.Scanner;

public class mult {

public static void main(String[] args)
{
int m,n;
Scanner s=new Scanner (System.in);
System.out.print("Enter the number");
int num=s.nextInt();
```

```
System.out.print("Enter range from m");
m=s.nextInt();
System.out.print("Enter range up to n");
n=s.nextInt();
for(int i=m;i<=n;i++)
{
System.out.println(num+"*"+i+"="+num*i);
}
s.close();
}

}
```

6) Static method

```
package JP;
import java.util.Scanner;

public class Staticmem
{
static double l;
static double w;
static double h;
static double vol;
static double volume(double l1, double w1, double h1)
{
System.out.println("volume of a box");
vol=l*w*h;
return vol;
}
static {
System.out.println("static block initialized");
}
public static void main(String[] args)
{
System.out.println("enter length");
Scanner sc=new Scanner(System.in);
l=sc.nextDouble();
System.out.println("enter breadth");
Scanner sc1=new Scanner(System.in);
w=sc1.nextDouble();
System.out.println("enter height");
Scanner sc2=new Scanner(System.in);
h=sc2.nextDouble();
vol=volume(l,w,h);
System.out.println(vol);

}

}
```

7) Average of 3 numbers

```
package JP;
import java.util.Scanner;
class Student{
int regno;
int marks1;
```

```
int marks2;
int marks3;
double avg;
double getavgCal()
{
return (marks1+marks2+marks3)/3;
}
void setMarks(int m1, int m2, int m3)
{
marks1=m1;
marks2=m2;
marks3=m3;
}
}
public class StudentMain{
public static void main(String[] args) {
Student s = new Student();
double percent;
int s1,s2,s3;
System.out.println("enter subject1 marks");
Scanner sc= new Scanner(System.in);
s1=sc.nextInt();
System.out.println("enter subject2 marks");
Scanner sc1= new Scanner(System.in);
s2=sc.nextInt();
System.out.println("enter subject2 marks");
Scanner sc2= new Scanner(System.in);
s3=sc.nextInt();
s.setMarks(s1,s2,s3);
percent=s.getavgCal();
System.out.println("Result is ");
if(s1<5 || s2<35 || s3<35)
System.out.println("Fail");
else
System.out.println("Promoted with ");
System.out.println("Average of the current sem="+percent);
sc.close();
}
}
```

8) Bank acct

```
package JP;
import java.io.*;
class BankAcc
{
private double bal;
BankAcc(double b)
{
bal=b;
}
void contact(double r) throws IOException
{
BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
System.out.print("Enter password");
String passwd= br.readLine();
if (passwd.equals ("xyz123"))
{
Interest in = new Interest(r);
```

```
in.calculateInterest();
}
else
{
System.out.println("Access denied");
return;
}
}
private class Interest
{
private double rate;
Interest (double r)
{
rate=r;
}
void calculateInterest()
{
double interest= bal* rate/100;
bal+= interest;
System.out.println("Balance is "+bal);
}
}
}
public class BankAcct
{
public static void main(String[] args) throws IOException
{
BankAcc account=new BankAcc(10000);
account.contact(9.5);
}
}
```

9) DMD

```
package JP;
import java.util.Scanner;
import java.math.*;
class A {
double x,y;
void display() {
System.out.println("Inside A's display method"); }
}
class B extends A {
void display() {
System.out.println("Inside B's display method"); }
}
class C extends A {
void display() {
System.out.println("Inside C's display method"); }
}
class DMD {
public static void main(String args[]) {
A a = new A();
B b = new B();
C c = new C();
A r;
r = a;
r.display();
```

```
r = b;
r.display();
r = c;
r.display();
}
}
```

10) Bil

```
package JP;
import java.util.Scanner;
class Commercial
{
void calculateBill (int units)
{
System.out.println ("Commercial connection bill"); System.out.println ("Bill amount=" + units *
5.00);
System.out.println();
}
}
class Domestic extends Commercial
{
void calculateBill (int units){
System.out.println ("Domestic connection bill");
System.out.println ("Bill amount=" + units * 2.50);
}
}
public class Bill {
public static void main(String[] args) {
Commercial c = new Commercial ();
Scanner sc = new Scanner (System.in);
System.out.println ("Commercial connection bill");
System.out.println("enetr units");
int amount = sc.nextInt();
c.calculateBill (amount);
Domestic d = new Domestic();
System.out.println ("Domestic connection bill");
System.out.println ("enter units");
int amt = sc.nextInt ();
d.calculateBill (amt);
}
}
I
```