Date __/__/__
Page _____
SPLASH

Lab program -①

1) Develop a java program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a, b, c and use the quadratic formula. If the discriminant b^2-4ac is negative, display a message stating that there are no real solutions.

Algo. 1) Input a, b, c
2) $d = b^2 - 4ac$
3) if (d = 0)
print ("Two equal roots")
$r_1 = r_2 = -b/2a$.
$r_2 = r1$
4) Else if (d > 0)
print ("Two distinct real numbers roots")
$r1 = (-b + \text{Sqrt}(d))/2a$.
$r2 = (-b - \text{Sqrt}(d))/2a$.
5) else
print ("No real solutions")
6) Exit.

prog.
```
class quadratic {
public static void main (String [] args) {
double a, b, c, r1 = 0, r2 = 0;
System.out.print ("Enter coefficients a, b & c of quadratic equation");
Scanner in = new Scanner (System.in);
```

```
a = in.nextFloat();
b = in.nextFloat();
c = in.nextFloat();
double d = (b*b) - (4*a*c);
if (d==0)
{
  System.out.println("Two equal real roots:");
r1 = -b/2*a;
r2 = r1;
}
else if (d>a)
{
  System.out.println("Two distinct real roots:");
  r1 = -b + Math.sqrt(d)/2*a;
  r2 = -b - Math.sqrt(d)/2*a;
}
else
{
  System.out.print("No real roots");
  System.exit(0);
}
System.out.println("Roots of quadratic equation are r1 = "+r1+" and r2="+r2);
}
}
```

Date __/__/__
Page _____
SPLASH

Expected Output:

Enter coefficient a, b and c of quadratic equation 1 2 1
Two equal real roots
Roots of quadratic equation are r1 = -1.0 and r2 = -1.0

Enter coefficient a, b and c of quadratic equation 1 and 2.
Two distinct real roots.
Roots of quadratic equation are r_1 = 2.585 and r_2 = -5.414

Enter coefficient a, b and c of quadratic equation 2 1 1
No real roots.