GHARDA FOUNDATION'S

GHARDA INSTITUTE OF TECHNOLOGY

Department of Computer Engineering

Evaluation Sheet

Class: T.E Computer Engineering **Sem:** VI

Subject: Cryptography and System Security

Experiment No: 7

Date:

Title of Experiment: Implementation of Diffie Hellman Key Exchange Algorithm.

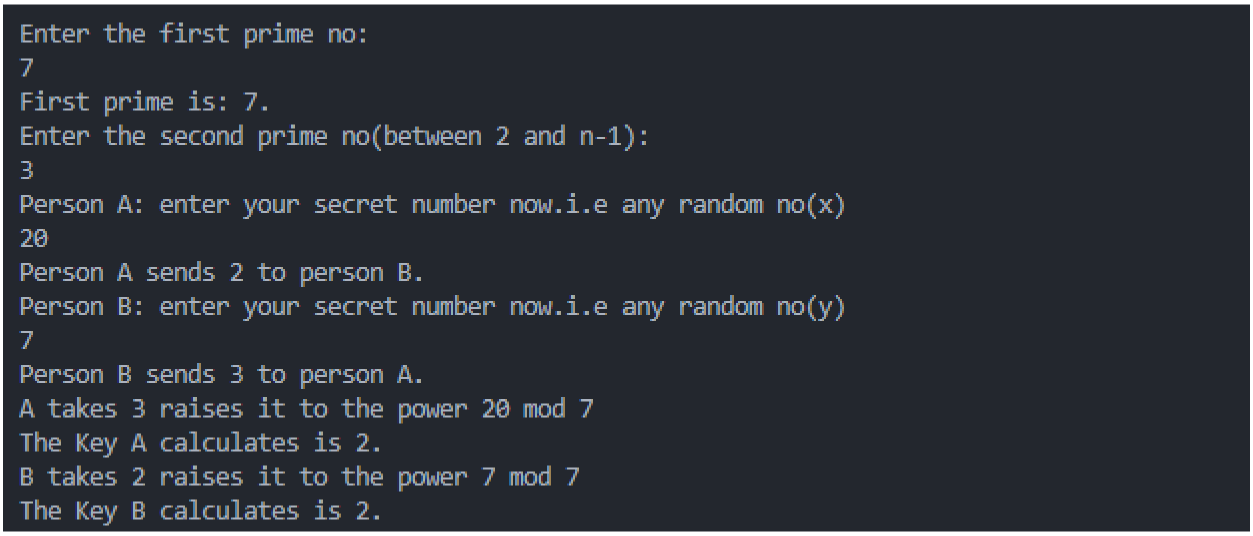
Sr. No.	Evaluation Criteria	Max Marks	Marks Obtained
1	Practical Performance	12	
2	Oral	2	
3	Timely Submission	1	
	Total	15	

Signature of Subject Teacher
[Vijesh M.Nair]

Program Code –

```
import java.math.BigInteger;

import java.util.*;


public class DiffieHellman {

  static final BigInteger one = new BigInteger("1");

  public static void main(String args[]) {

    Scanner stdin = new Scanner(System.in);

    BigInteger n;

    // Get a start spot to pick a prime from the user.

    System.out.println("Enter the first prime no:");

    String ans = stdin.next();

    n = getNextPrime(ans);

    System.out.println("First prime is: " + n + ".");

    // Get the base for exponentiation from the user.

    System.out.println("Enter the second prime no(between 2 and n-1):");

    BigInteger g = new BigInteger(stdin.next());

    // Get A's secret number.

    System.out.println(

      "Person A: enter your secret number now.i.e any random no(x)"

    );

    BigInteger a = new BigInteger(stdin.next());

    // Make A's calculation.

    BigInteger resulta = g.modPow(a, n);

    // This is the value that will get sent from A to B.

    // This value does NOT compromise the value of a easily.

    System.out.println("Person A sends " + resulta + " to person B.");

    // Get B's secret number.

    System.out.println(

      "Person B: enter your secret number now.i.e any random no(y)"

    );
    BigInteger b = new BigInteger(stdin.next());

    stdin.close();

    // Make B's calculation.

    BigInteger resultb = g.modPow(b, n);

    // This is the value that will get sent from B to A.

    // This value does NOT compromise the value of b easily.

    System.out.println("Person B sends " + resultb + " to person A.");

// Once A and B receive their values, they make their new calculations.

    // This involved getting their new numbers and raising them to the //
same power as before, their secret number.

    BigInteger KeyACalculates = resultb.modPow(a, n);

    BigInteger KeyBCalculates = resulta.modPow(b, n);

    // Print out the Key A calculates.

    System.out.println(

      "A takes " + resultb + " raises it to the power " + a + " mod " + n

    );

    System.out.println("The Key A calculates is " + KeyACalculates + ".");

    // Print out the Key B calculates.

    System.out.println(

      "B takes " + resulta + " raises it to the power " + b + " mod " + n

    );

    System.out.println("The Key B calculates is " + KeyBCalculates + ".");

  }


  public static BigInteger getNextPrime(String ans) {

    BigInteger test = new BigInteger(ans);

    while (!test.isProbablePrime(99)) test = test.add(one);

    return test;

  }

}
```

Output –



```
Enter the first prime no:
7
First prime is: 7.
Enter the second prime no(between 2 and n-1):
3
Person A: enter your secret number now.i.e any random no(x)
20
Person A sends 2 to person B.
Person B: enter your secret number now.i.e any random no(y)
7
Person B sends 3 to person A.
A takes 3 raises it to the power 20 mod 7
The Key A calculates is 2.
B takes 2 raises it to the power 7 mod 7
The Key B calculates is 2.
```