8) To implement the Diffie-Hellman Key Exchange algorithm using python language.

PROGRAM:-

```
def power(a, b, mod):
    if b == 1:
        return a % mod
    t = power(a, b // 2, mod)
    if b % 2 == 0:
        return (t * t) % mod
    else:
        return ((t * t) % mod * a) % mod
def calculate_key(a, x, n):
    return power(a, x, n)
def main():
    n = int(input("Enter the value of n: "))
    g = int(input("Enter the value of g: "))
    x = int(input("Enter the value of x for the first person: "))
    a = power(g, x, n)
    y = int(input("Enter the value of y for the second person: "))
    b = power(g, y, n)
    print(f"Key for the first person is: {power(b, x, n)}")
    print(f"Key for the second person is: {power(a, y, n)}")
if __name__ == "__main__":
    main()
```

OUTPUT:-

```
Enter the value of n: 7
Enter the value of g: 6
Enter the value of x for the first person: 15
Enter the value of y for the second person: 1
Key for the first person is: 6
Key for the second person is: 6
```