

Exp 2a : RSA Algorithm

Code:

```
//RSA Algorithm
#include <stdio.h>
#include <math.h>

int gcd(int a, int h) {
    int temp;
    while (1) {
        temp = a % h;
        if (temp == 0)
            return h;
        a = h;
        h = temp;
    }
}

int main() {
    int p = 3;
    int q = 7;

    printf("\nValue of p = %d",p);
    printf("\nValue of q = %d",q);
    int n = p * q;
    printf("\nValue of n = %d",n);

    int e = 2;
    int phi = (p - 1) * (q - 1);
    while (e < phi) {

        if (gcd(e, phi) == 1)
            break;
        else
            e++;
    }

    int k = 2;
    double d = (1 + (k * phi)) / (double)e;

    int msg = 9;

    printf("\n\nMessage data = %d", msg);

    double c = pow(msg, e);
    c = fmod(c, n);
    printf("\nEncrypted data = %.0lf", c);
```

```
double m = pow(c, d);  
m = fmod(m, n);  
printf("\nOriginal Message Sent = %.0lf", m);  
  
return 0;  
}
```

Output:

```
Value of p = 3  
Value of q = 7  
Value of n = 21  
  
Message data = 9  
Encrypted data = 18  
Original Message Sent = 9
```
