

# TUGAS PRAKTIKUM KRIPTORAFI

## 1. Elgamal

$P = 37; g = 3; x = 2; k = 10.$

PT = MENCINTAIMU

$M = 12; E = 4; N = 13; C = 2; I = 8; T = 19; A = 0; U = 20.$

### **Encryption**

$$Y = g^x \bmod p$$

$$Y = 3^x \bmod 37$$

$$Y = \bmod 37$$

$$Y = 9.$$

$$C_1 = g^k \bmod p$$

$$C_1 = 3^{10} \bmod 37$$

$$C_1 = 34$$

$$C_2(1) = M \times Y^k \bmod p$$

$$C_2(1) = 12 \times 9^{10} \bmod 37 = 34$$

$$C_2(2) = 4 \times 9^{10} \bmod 37 = 36$$

$$C_2(3) = 13 \times 9^{10} \bmod 37 = 6$$

$$C_2(4) = 2 \times 9^{10} \bmod 37 = 18$$

$$C_2(5) = 8 \times 9^{10} \bmod 37 = 35$$

$$C_2(6) = 19 \times 9^{10} \bmod 37 = 23$$

$$C_2(7) = 0 \times 9^{10} \bmod 37 = 0$$

$$C_2(8) = 20 \times 9^{10} \bmod 37 = 32$$

$$\mathbf{CT = (34,34),(34,46),(34,6),(34,18),(34,18),(34,35),(34,23),(34,0),(34,32)}$$

## Decryption

$$C_1^x = (C_1)^x \bmod p$$

$$C_1^x = 34^2 \bmod 37 = 9$$

$$M(1) = C_2 * (C_1^x)^{-1} \bmod p$$

$$= 34 * 9^{-1} \bmod 37$$

$$\gcd(37, 9)$$

$$37 = 9 * 4 + 1$$

$$t_0 = 0$$

$$t_1 = 1$$

$$t_2 = 0 - 1(4) \bmod 37 = -4 \bmod 37 = 33$$

$$M(1) = 34 * 33 \bmod 37 = 12 \text{ (M)}$$

$$M(2) = 36 * 33 \bmod 37 = 4 \text{ (E)}$$

$$M(3) = 6 * 33 \bmod 37 = 13 \text{ (N)}$$

$$M(4) = 18 * 33 \bmod 37 = 2 \text{ (C)}$$

$$M(5) = 35 * 33 \bmod 37 = 8 \text{ (I)}$$

$$M(6) = 23 * 33 \bmod 37 = 19 \text{ (T)}$$

$$M(7) = 0 * 33 \bmod 37 = 0 \text{ (A)}$$

$$M(8) = 32 * 33 \bmod 37 = 20 \text{ (U)}$$

PT = MENCINTAIMU

## **RSA**

PT = TEMAN

$P = 17; q = 11;$

$n = p * q = 17 * 11 = 187.$

$m = (p - 1) \times (q - 1)$

$m = (17-1) \times (11-1)$

$m = 160$

$e = 17$

$\text{gcd}(17, 160)$

$160 = 17 * 9 + 7$

$17 = 7 * 2 + 3$

$7 = 3 * 2 + 1$

$T_0 = 0$

$T_1 = 1$

$T_2 = 0 - 1(9) \bmod 160 = 151$

$T_3 = 1 - 151(2) \bmod 160 = 19$

$T_4 = 151 - 19(2) \bmod 160 = 113$

$d = e^{-1} \bmod m$

$$d = 113 \bmod 160 = 113$$

Kunci public = (17,187); Privat = (117, 187).

Enkripsi

$$C_i = M_i^e \bmod n$$

$$T = 19; e = 4; M = 12; A = 0; N = 13;$$

$$C_1 = 19^{17} \bmod 187 = 2$$

$$C_2 = 4^{17} \bmod 187 = 38$$

$$C_3 = 12^{17} \bmod 187 = 12$$

$$C_4 = 0^{17} \bmod 187 = 0$$

$$C_5 = 13^{17} \bmod 187 = 183$$

Dekripsi

$$M_i = C_i^d \bmod n$$

$$CT = 2, 38, 12, 0, 183$$

$$M_1 = 2^{113} \bmod 187 = 19$$

$$M_2 = 38^{113} \bmod 187 = 4$$

$$M_3 = 12^{113} \bmod 187 = 12$$

$$M_4 = 0^{113} \bmod 187 = 0$$

$$M_5 = 183^{113} \bmod 187 = 13$$