

Курсов 03 62

Вариант 6

1. H046

2. H: 001; O: 011; P: 000; P: 101; C: 100; T: 11; Y: 010

3. 222

4. (1, 2, 0)

$e=23$

$m=51$

[42; 16; 49; 21]

N1

1.  $de = 1 \bmod \varphi(m)$  ;  $\varphi(51) = \varphi(17) \cdot \varphi(3) = 16 \cdot 2 = 32$

$23d = 1 \bmod 32$

$\frac{d}{23} = \frac{-4}{32} \Rightarrow 23d + 32y' = 1$

i	-1	0	1	2	3	4	5
r	32	23	9	5	4	1	0
q		1	2	1	1	4	
d	0	1	-1	3	-4	7	

$d=7$

$42^7 \bmod 51$  ;  $7_{10} = 11_2$

$a; c \quad c^2 \quad c^2 \cdot a^i \quad c^2 \cdot a^i \bmod h$

1 1 1 42 42

1 42 1764 74088 36

1 36 1296 54432 15

$42^7 \bmod 51 = 15$

$$16^7 \bmod 51;$$

$$a_i \quad c \quad c^2 \quad c^2 \cdot a_i \quad c^2 \cdot a_i \bmod k$$

$$1 \quad 1 \quad 1 \quad 16 \quad 16$$

$$1 \quad 16 \quad 256 \quad 4096 \quad 16$$

$$1 \quad 16 \quad 256 \quad 4096 \quad 16$$

$$16^7 \bmod 51 = 16;$$

$$49^7 \bmod 51;$$

$$a_i \quad c \quad c^2 \quad c^2 \cdot a_i \quad c^2 \cdot a_i \bmod k$$

$$1 \quad 1 \quad 1 \quad 49 \quad 49$$

$$1 \quad \underline{49} \quad 2401 \quad 117649 \quad 43$$

$$1 \quad 43 \quad 1849 \quad 90601 \quad 25$$

$$49^7 \bmod 51 = 25;$$

$$21^7 \bmod 51;$$

$$a_i \quad c \quad c^2 \quad c^2 \cdot a_i \quad c^2 \cdot a_i \bmod k$$

$$1 \quad 1 \quad 1 \quad 21 \quad 21$$

$$1 \quad 21 \quad 441 \quad 9261 \quad 30$$

$$1 \quad 30 \quad 900 \quad 18900 \quad 30$$

$$21^7 \bmod 51 = 30$$

$$(15, 16, 25, 30)$$

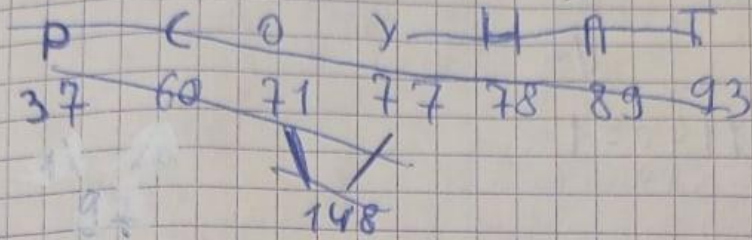
$$H \quad 0 \quad 4 \quad 6$$

$$\underline{\text{Answer}}: H046$$



N2

И(78); О(71); П(89); Р(37); С(60); Т(93); У(77)



Соединяем:

~~Р(37), С(60), О(71), У(77), И(78), П(89), Т(93)~~

~~О(71), У(77), И(78), П(89), Т(93), Р(37)~~

~~И(78), П(89), Т(93), РС(97), ОУ(148)~~

~~Т(93), РС(97), ОУ(148), ИП(167)~~

~~ОУ(148), ИП(167), ТРС(190)~~

~~ТРС(190), ОУИП(315)~~

Расшиняем:

1(ТРС), 0(ОУИП)

1(ТРС), 01(ОУ), 00(ИП)

11(Т), 10(РС), 01(ОУ), 00(ИП)

11(Т), 10(РС), 01(ОУ), 001(ИП), 000(П)

11(Т), 011(О), 010(У), 10(РС), 001(И), 000(П)

101(Р), 100(С), 11(Т), 011(О), 010(У), 001(И), 000(П)

Результат:

001(И), 011(О), 000(П), 101(Р), 100(С), 11(Т), 010(У)

Answer:  $H: 001$ ;  $D: 011$ ;  $E: 000$ ;  $P: 101$ ;  $C: 100$ ;  
 $T: 11$ ;  $Y: 010$ .

$\sqrt{3}$

10110001  
0 1 2 3 4 5 6 7

0: 1

1:  $1+0=1$

2:  $1+0+1=0$

3:  $1+0+1+1=1$

4:  $1+0+1+1+0=1$

5:  $1+0+1+1+0+0=1$

6:  $1+0+1+1+0+0+0=1$

7:  $1+0+1+1+0+0+0+1=0$

$\begin{matrix} 1 & 1 & 0 & 1 & 1 & 1 & 1 & 0 \\ 2^7 & 2^6 & 2^5 & 2^4 & 2^3 & 2^2 & 2^1 & 2^0 \end{matrix} = 128 + 64 + 16 + 8 + 4 + 2 = 222_{10}$

Answer: 222



$$\deg P(x) \leq 2 \quad \sqrt{4} \quad \deg 3 \quad \wedge \quad \deg 5$$

$$Q(x) = P(x) \cdot D(x) \equiv P(x) \cdot D(x)$$

$\mathbb{Z}_5$

$$\deg D(x) \leq 1$$

$$(3, 3, 0, 2, 1)$$

$$Q(x) = q_0 + q_1x + q_2x^2 + q_3x^3$$

$$P(x) = \frac{Q(x)}{D(x)}$$

$$q_0 + q_1x + q_2x^2 + q_3x^3 = (x - d) \hat{P}(x)$$

$$\deg \hat{P}(x) \leq 4$$

$$(0) \quad x=0 : q_0 = -3d$$

$$(1) \quad x=1 : q_0 + q_1 + q_2 + q_3 = 3 - 3d$$

$$(2) \quad x=2 : q_0 + 2q_1 + 4q_2 + 3q_3 = 0$$

$$(3) \quad x=-2 : q_0 - 2q_1 + 4q_2 - 3q_3 = -9 - 2d$$

$$(4) \quad x=-1 : q_0 - q_1 + q_2 - q_3 = 1 - d$$

$$\left( \begin{array}{ccccc|c} 1 & 0 & 0 & 0 & 3 & 0 \\ 1 & 1 & 1 & 1 & 3 & 3 \\ 1 & 2 & 4 & 3 & 0 & 0 \\ 1 & -2 & 4 & -3 & 2 & -4 \\ 1 & -1 & 1 & -1 & 1 & 1 \end{array} \right) \sim \left( \begin{array}{ccccc|c} 1 & 0 & 0 & 0 & 3 & 0 \\ 0 & 1 & 1 & 1 & 0 & 3 \\ 0 & 2 & 4 & 3 & -3 & 0 \\ 0 & -2 & 4 & -3 & -1 & 1 \\ 0 & -1 & 1 & -1 & 3 & 1 \end{array} \right) \sim$$

$$\sim \left( \begin{array}{ccccc|c} 1 & 0 & 0 & 0 & 3 & 0 \\ 0 & 1 & 1 & 1 & 0 & 3 \\ 0 & 0 & 2 & 1 & -3 & -6 \\ 0 & 0 & 6 & -1 & -1 & 2 \\ 0 & 0 & 2 & 0 & 3 & 4 \end{array} \right) \sim \left( \begin{array}{ccccc|c} 1 & 0 & 0 & 0 & 3 & 0 \\ 0 & 1 & 1 & 1 & 0 & 3 \\ 0 & 0 & 2 & 1 & -3 & -1 \\ 0 & 0 & 0 & 1 & 3 & 0 \\ 0 & 0 & 0 & -1 & 1 & 0 \end{array} \right) \sim$$

$$\sim \left( \begin{array}{ccccc|c} 1 & 0 & 0 & 0 & 3 & 0 \\ 0 & 1 & 1 & 1 & 0 & 3 \\ 0 & 0 & 2 & 1 & -3 & -1 \\ 0 & 0 & 0 & 1 & 3 & 0 \\ 0 & 0 & 0 & 0 & 4 & 0 \end{array} \right) \sim \left( \begin{array}{ccccc|c} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 3 \\ 0 & 0 & 2 & 1 & 0 & -1 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{array} \right) \sim$$

$$\sim \left( \begin{array}{ccccc|c} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 & 0 & 3 \\ 0 & 0 & 2 & 0 & 0 & 4 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{array} \right) \sim \left( \begin{array}{ccccc|c} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 & 2 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \end{array} \right) \begin{array}{l} = q_0 \\ = q_1 \\ = q_2 \\ = q_3 \\ = q \end{array}$$

2x + 1

$$\frac{2x^2 + x}{x} = 2x + 1$$

Answer: (1, 2, 0)