2.> One time pad →

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

a) Message = "paynow"
   key = 231450

$$\begin{array}{cccccc} p & a & y & n & o & w \\ 15 & 0 & 24 & 13 & 14 & 22 \end{array}$$

numbers

key ⇒

$$\begin{array}{cccccc} 2 & 3 & 1 & 4 & 5 & 0 \end{array}$$

(Add & do mod 26) (17×26) (3×26) (25×26) (17×26) (19×26) (22×26)

$$\begin{array}{cccccc} 17 & 3 & 25 & 17 & 19 & 22 \end{array}$$

Ans — Ciphertext $[\,r \quad d \quad z \quad r \quad t \quad w\,]$

b) Ciphertext   r d z r t w
   (key)   17 3 25 17 19 22

   Plaintext
   (key) is   n o b n o w
                 13 14 19 13 14 22

   clue (do subtraction) $(3-14)\times 26$ $(17-13)\times 26$ 0×26
                          $(17-13)\times 26$ $(25-19)\times 26$ $(19-14)\times 26$

   $$\begin{array}{cccccc} 4 & 15 & 6 & 4 & 5 & 0 \end{array}$$

$$\begin{array}{r} +26 \\ -11 \\ \hline 15 \end{array}$$

Ans * key $[\,e \quad p \quad g \quad e \quad f \quad a\,]$