

2) a)

	$u$	$c = uG = (u \ uP)$	$w(c)$
c1	00	0000	0
c2	01	01	2
c3	10	10	2
c4	11	11	4

~~$d_{\min} = 4?$   $c2 = 0111 \rightarrow d(c2) = 4$~~

~~$d_{\min} = 3?$   $c2 = 0111 \rightarrow d(c2) = 3$   
 $c3 = 1011 \rightarrow d(c2) = 3$~~

$d_{\min} = 2?$

$c2 \rightarrow \begin{matrix} 01 & 01 \\ 01 & 10 \end{matrix}$

$c3 \rightarrow \begin{matrix} 10 & 10 \\ 10 & 01 \end{matrix}$

0111  
1011  
-----  
1100  $\rightarrow d(c4) = 2$

0101  
1001  
-----  
1100  $\rightarrow d(c4) = 2$

b)

$$\begin{array}{l}
 \begin{matrix} I & P \\ c2(01) \cdot \begin{pmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 1 \end{pmatrix} = 0101 \\ \\ c3(10) \cdot \begin{pmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \end{pmatrix} = 1010 \end{matrix} \\
 \end{array}
 \end{array}
 \end{array}
 \begin{array}{l}
 \begin{matrix} I & P \\ \begin{pmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \end{pmatrix} G \end{matrix}
 \end{array}
 \end{array}$$

c)

$$H = \begin{pmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \end{pmatrix}$$

d) detecta  $d_{\min} - 1$  errores = 1

corrije  $(d_{\min} - 1)/2$  errores = 0

$$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \checkmark$$