(a)

x_1	x_2	x_3
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0
1	0	1
1	1	0
1	1	1

$\Rightarrow$

$$
\begin{aligned}
&g = 0\\
&a_3 > g\\
&a_2 > g\\
&a_2 + a_3 + b_{2,3} = g\\
&a_1 > g\\
&a_1 + a_3 + b_{1,3} = g\\
&a_1 + a_2 + b_{1,2} = g\\
&a_1 + a_2 + a_3 + b_{1,2} + b_{1,3} + b_{2,3} > g
\end{aligned}
$$

(b)

x_1	x_2	x_3	x_4
0	0	0	0
0	0	0	1
0	0	1	0
0	0	1	1
0	1	0	0
0	1	0	1
0	1	1	0
0	1	1	1
1	0	0	0
1	0	0	1
1	0	1	0
1	0	1	1
1	1	0	0
1	1	0	1
1	1	1	0
1	1	1	1

$\Rightarrow$

$$
\begin{aligned}
&g = 0\\
&a_4 > g\\
&a_3 > g\\
&a_3 + a_4 + b_{3,4} > g\\
&a_2 > g\\
&a_2 + a_4 + b_{2,4} > g\\
&a_2 + a_3 + b_{2,3} = g\\
&a_2 + a_3 + a_4 + b_{2,3} + b_{2,4} + b_{3,4} > g\\
&a_1 > g\\
&a_1 + a_4 + b_{1,4} > g\\
&a_1 + a_3 + b_{1,3} = g\\
&a_1 + a_3 + a_4 + b_{1,3} + b_{1,4} + b_{3,4} > g\\
&a_1 + a_2 + b_{1,2} > g\\
&a_1 + a_2 + a_4 + b_{1,2} + b_{1,4} + b_{2,4} = g\\
&a_1 + a_2 + a_3 + b_{1,2} + b_{1,3} + b_{2,3} > g\\
&a_1 + a_2 + a_3 + a_4 + b_{1,2} + b_{1,3} + b_{1,4} + b_{2,3} + b_{2,4} + b_{3,4} > g
\end{aligned}
$$

(c)

$$C(x) = x_1 + x_2 + x_3 + 4x_4 + 2x_1x_2 - 2x_1x_3 - 4x_1x_4 - 2x_2x_3 - 4x_2x_4 + 4x_3x_4$$

$$\Rightarrow$$

$$H(\sigma) = -\tfrac{1}{2}\sigma_1 - \tfrac{1}{2}\sigma_2 + \tfrac{1}{2}\sigma_3 + \sigma_4 + \tfrac{1}{2}\sigma_1\sigma_2 - \tfrac{1}{2}\sigma_1\sigma_3 - \sigma_1\sigma_4 - \tfrac{1}{2}\sigma_2\sigma_3 - \sigma_2\sigma_4 + \sigma_3\sigma_4$$