Step-1

$$\begin{vmatrix} 4 & 4 & 4 & 4 \\ 1 & 2 & 0 & 1 \\ 2 & 0 & 1 & 2 \\ 1 & 1 & 0 & 2 \end{vmatrix}$$

Given matrix

So, consider

$$\begin{vmatrix} 4 & 4 & 4 & 4 \\ 1 & 2 & 0 & 1 \\ 2 & 0 & 1 & 2 \\ 1 & 1 & 0 & 2 \end{vmatrix}$$

$$=4\begin{vmatrix} 2 & 0 & 1 \\ 0 & 1 & 2 \\ 1 & 0 & 2 \end{vmatrix}-4\begin{bmatrix} 1 & 0 & 1 \\ 2 & 1 & 2 \\ 1 & 0 & 2 \end{bmatrix}+4\begin{vmatrix} 1 & 2 & 1 \\ 2 & 0 & 2 \\ 1 & 1 & 2 \end{vmatrix}-4\begin{vmatrix} 1 & 2 & 0 \\ 2 & 0 & 1 \\ 1 & 1 & 0 \end{vmatrix}$$

Step-2

On solving

$$= 4\left[2(2)+1(-1)\right]-4\left[1(2)+(-1)\right]+4\left[(-2)-2(2)+2\right]-4\left[0-1-2(-1)\right]$$

$$= 4(3)-4(1)+4(-4)-4(1)$$

$$= 4(3-1-4-1)$$

$$= 4(-3)$$

$$= \boxed{-12}$$

Step-3

b) We recomputed the same determinant by subtracting 1st column from other columns.

$$\begin{vmatrix} 4 & 4 & 4 & 4 \\ 1 & 2 & 0 & 1 \\ 2 & 0 & 1 & 2 \\ 1 & 1 & 0 & 2 \end{vmatrix}=\begin{vmatrix} 4 & 0 & 0 & 0 \\ 1 & 1 & -1 & 0 \\ 2 & -2 & -1 & 0 \\ 1 & 0 & -1 & 1 \end{vmatrix}$$ subtracting 1st column from remaining columns

$$= 4 \begin{vmatrix} 1 & -1 & 0 \\ -2 & -1 & 0 \\ 0 & -1 & 1 \end{vmatrix}$$

Step-4

On solving

$$= 4 \begin{vmatrix} 1 & -1 \\ -2 & -1 \end{vmatrix} \text{expanding by last columns}$$

$$= 4(-1-2)$$
$$= \boxed{-12}$$