

b.

1st Layer :

$$\text{sigmoid} \times \begin{bmatrix} 4.0104 & 3.7868 & -6.0784 \\ -0.3395 & 0.6314 & 2.0088 \\ 2.9316 & 2.6832 & -4.4733 \\ 7.2526 & 7.3698 & -3.3711 \end{bmatrix} \times \begin{bmatrix} 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

$$= \text{sigmoid} \times \begin{bmatrix} -6.0784 & -2.2916 & -2.068 & 1.7188 \\ 2.0088 & 2.6402 & 1.6693 & 2.3007 \\ -4.4733 & -1.7901 & -1.5417 & 1.1415 \\ -3.3711 & 3.9987 & 3.8815 & 11.2513 \end{bmatrix}$$

$$= \begin{bmatrix} 0.002287 & 0.091821 & 0.112246 & 0.847974 \\ 0.881718 & 0.933404 & 0.841482 & 0.908935 \\ 0.011281 & 0.14306 & 0.176288 & 0.757955 \\ 0.033211 & 0.981991 & 0.979797 & 0.999987 \end{bmatrix}$$

2nd Layer :

$$\text{sigmoid} \times [-8.4913 \quad -5.7605 \quad -6.2857 \quad 12.2002]$$

$$\times \begin{bmatrix} 0.002287 & 0.091821 & 0.112246 & 0.847974 \\ 0.881718 & 0.933404 & 0.841482 & 0.908935 \\ 0.011281 & 0.14306 & 0.176288 & 0.757955 \\ 0.033211 & 0.981991 & 0.979797 & 0.999987 \end{bmatrix}$$

$$= \text{sigmoid} \times [-4.7643 \quad 4.9247 \quad 5.0452 \quad -5.00056]$$

$$= [0.008457 \quad 0.992787 \quad 0.993601 \quad 0.006689]^T$$

$$= \begin{bmatrix} 0.008457 \\ 0.992787 \\ 0.993601 \\ 0.006689 \end{bmatrix}$$