

Answer :

$$\therefore W_{0,0}^{(1)} a_0^{(1)} + W_{0,1}^{(1)} a_1^{(1)} + b_0^{(1)} \quad \text{and} \quad \vec{a}^{(1)} = W^{(1)} \vec{a}^{(0)} + \vec{b}^{(1)}$$

$$\vec{a}^{(2)} = W^{(2)} \vec{a}^{(1)} + \vec{b}^{(2)}$$

$$\therefore \vec{a}^{(2)} = W^{(2)} W^{(1)} a^{(0)} + W^{(2)} \vec{b}^{(1)} + \vec{b}^{(2)}$$

$$\vec{a}^{(3)} = W^{(3)} W^{(2)} W^{(1)} a^{(0)} + W^{(3)} W^{(2)} \vec{b}^{(1)} + W^{(3)} \vec{b}^{(2)} + \vec{b}^{(3)}$$

Also, to make Network 1 be equivalent with Network 2.

$$\therefore \tilde{W} = W^{(3)} W^{(2)} W^{(1)}$$

$$\tilde{b} = W^{(3)} W^{(2)} \vec{b}^{(1)} + W^{(3)} \vec{b}^{(2)} + \vec{b}^{(3)}$$