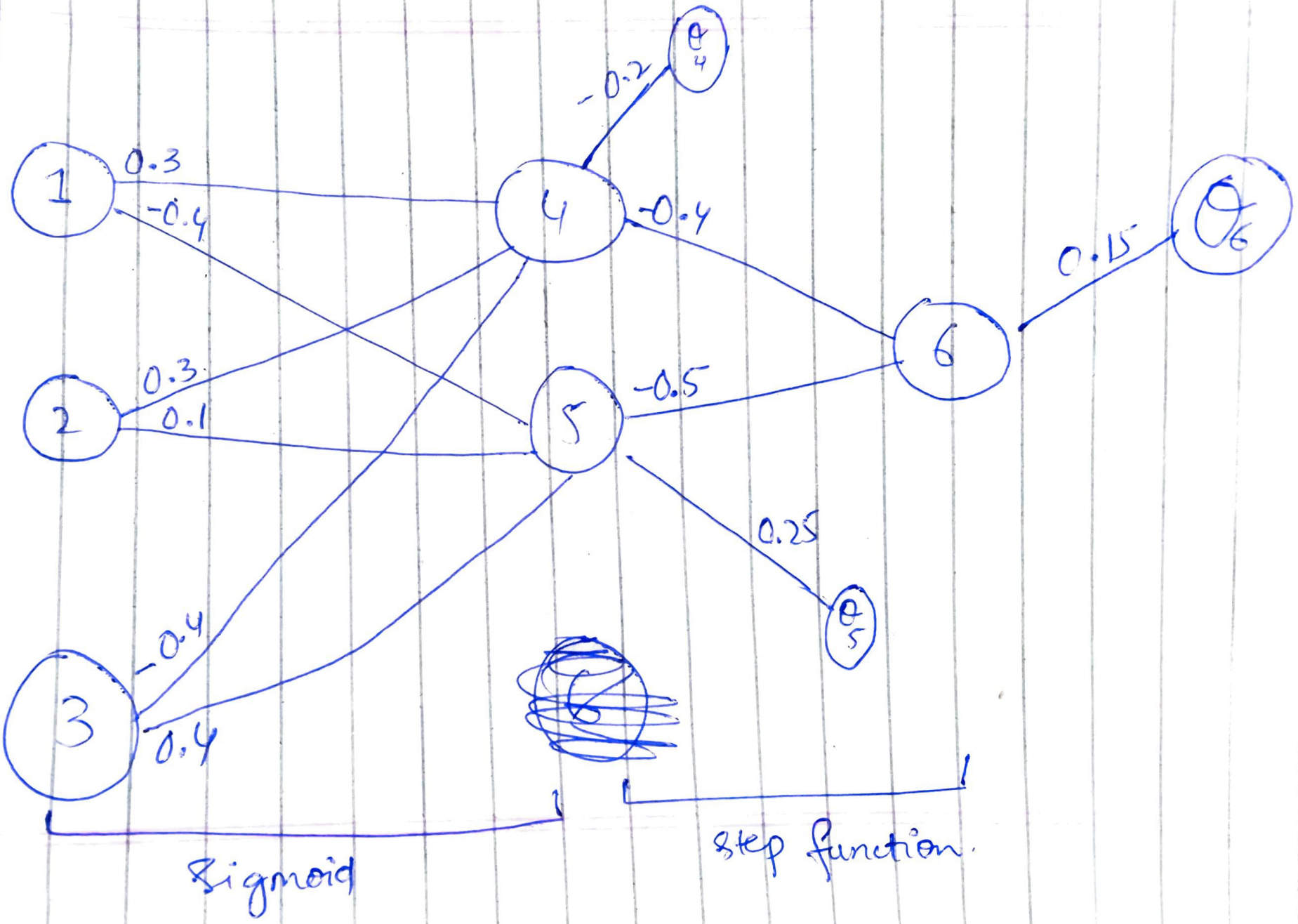
5


1
2
3
4
5
6
0.3
-0.4
0.3
0.1
-0.4
0.4
-0.2
-0.4
-0.5
0.25
0.15
θ4
θ5
θ6
Sigmoid
step function.

(5) $x_1 = 1$, $x_2 = 0$, $x_3 = 1$

$t = 1$, $l = 0.7$

for Neuron 4:

$$a = (0.3 \times 1 + 0.3 \times 0 - 0.4 \times 1) + (-0.2)$$

$$a = -0.1 - 0.2 = -0.3$$

$$Y = \frac{1}{1+e^{-a}} = \frac{1}{1+e^{0.3}} = 0.425557$$

for Neuron 5:

$$a = ((-0.4)1 + (0.1)0 + (0.4)1) + 0.25$$

$$a = 0.25$$

$$Y = 0.437823$$

for Neuron 6:

$$a = ((0.425577)(-0.4) + (0.437823) \times (0.5)) + 0.15$$

$$a = 0.1986835$$

$$Y = \begin{cases} 1 & a > 0.5 \\ 0 & a < 0.5 \end{cases}$$

$$Y = 0$$

Error at 6:

$e_6 = (t - y)$

$e_6 = (1 - 0) = 1$

Error at 4:

$e_4 = (t - y)[e_6 w_{46}]$

$e_4 = -0.4$

Error at 5:

$E_5 = (t - y)[e_6 w_{56}]$

$E_5 = -0.5$

Error at 1:

$e_1 = (t - y)[e_4 w_{14} + e_5 w_{15}]$

$= -0.4 \times 0.3 + (-0.5)(-0.4) = 0.8$

Error at 2:

$e_2 = (t - y)[e_4 w_{24} + e_5 w_{25}]$

$e_2 = (-0.4 \times 0.3) + (-0.5) \times (0.1)$

$e_2 = -0.17$

error at 3:

$$e_3 = (t-y)[e_4 w_{34} + e_5 w_{35})$$
$$e_3 = -0.4 \times (-0.4) + (-0.5)(0.4)$$
$$e_3 = -0.36$$

Weights = weight + learning rate × error

$$w_{14} = 0.3 + (0.7 \times +0.8) = 0.86$$
$$w_{15} = -0.4 + (0.7 \times 0.8) = 0.16$$
$$w_{24} = 0.3 + (0.7 \times -0.17) = 0.181$$
$$w_{25} = 0.1 + (0.7 \times -0.17) = -0.019$$
$$w_{34} = -0.4 + (0.7 \times -0.36) = -0.652$$
$$w_{35} = 0.4 + (0.7 \times (-0.36)) = 0.148$$
$$w_{46} = -0.4 + (0.7 \times -0.4) = -0.68$$
$$w_{56} = -0.5 + (0.7 \times -0.5) = -0.85$$