# LAB - 0

## ANS - 2.1

Given $y_i = f(w_0 + w_1 x)$.

$y_i = f(5 \cdot 6)$.

(i) $y_i = 1.6$ the f is not possible.

(ii) $y_i = 1.0$ then f = signum Function.

(iii) $y_i = 0.9963 \longrightarrow$ f = Log sigmoidal.

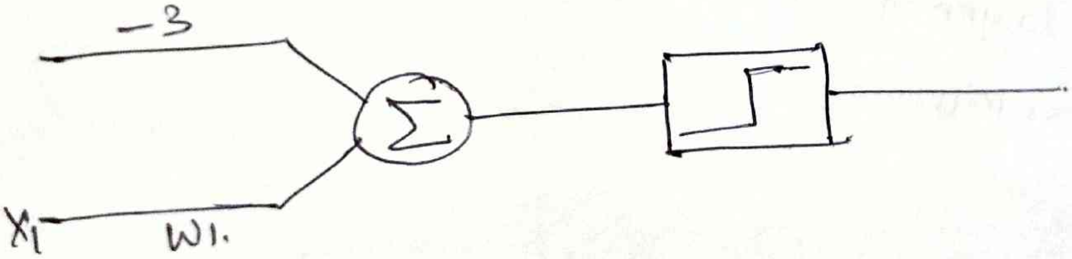
(iv) $y_i = -1$ then f = is not possible.

## ANS-2.2

(i) symmatrical hard limit function is required.

(ii) we can take $w_0 = -3$ as a bias. Bias is Not Related to Input weight.

(iii)




## ANS 2.3

(i) If bias is zero then:

$$y_i = f(w_0 + w_1 s_1 + w_2 s_2)$$

$$w_0 = 0$$

$$0.5 = f(0 + 3 \times -5 + 2 \times 7)$$

$$0.5 = f(-1)$$

there is no f from table 2.1 possible.

(II) ~~bias = 1.5~~ Yes, there is a bias the

Linear transfer function is used.

bias = 1.5 and f is purelin.

(III) Yes, a Log-sigmoid transfer function is.

used. , bias = 1.

(IV). NO, bias is possible if symmetrical hardlim.

is used.

ANS 2.4

(I) In 2nd layer 4 neurons are required.

corresponding to 4 outputs.

In layer 1 No: of neuron cannot be

determined.

(II).

(III) Log-sigmoidal transfer function can be used

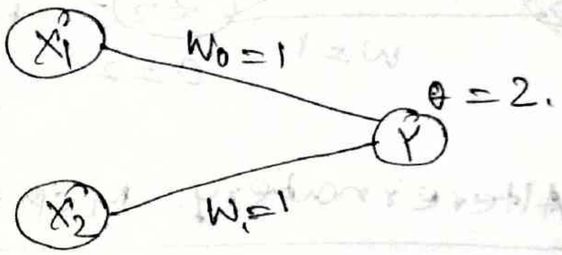
in each layer.

(IV) NO.

ANS-4 (a)

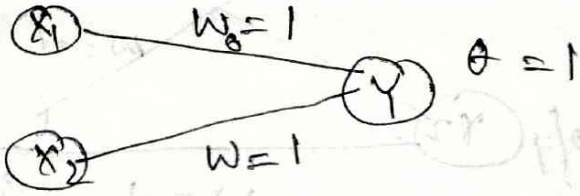
a) AND Gate

| $X_1$ | $X_2$ | $Y$ |
|---|---|---|
| -1 | -1 | -1 |
| -1 | 1 | -1 |
| 1 | -1 | -1 |
| 1 | 1 | 1. |



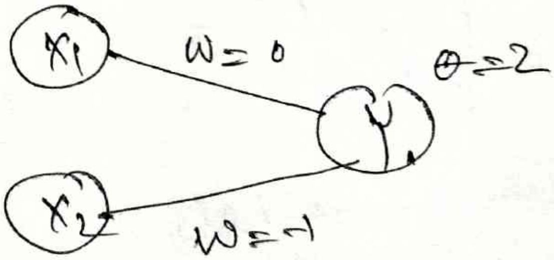

b) OR Gate

| $X_1$ | $X_2$ | $Y$ |
|---|---|---|
| 1 | 1 | 1 |
| 1 | -1 | 1 |
| -1 | 1 | 1 |
| -1 | -1 | -1 |




c) AND-NOT

| $X_1$ | $X_2$ | $Y$ |
|---|---|---|
| -1 | -1 | -1 |
| -1 | 1 | -1 |
| 1 | -1 | 1 |
| 1 | 1 | -1 |

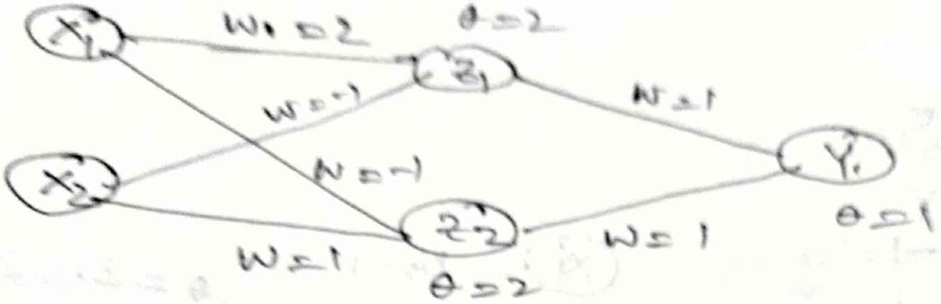



ANS-4 (b)

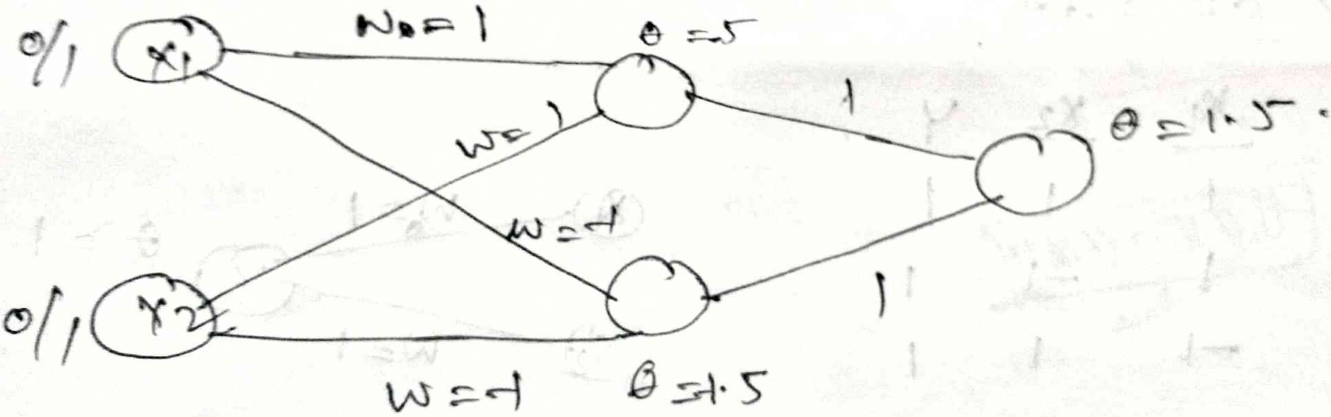
| $X_1$ | $X_2$ | $Z_1$ | $Z_2$ | $Y$ |
|---|---|---|---|---|
| -1 | -1 | -1 | -1 | -1 |
| -1 | 1 | -1 | +1 | 1 |
| 1 | -1 | 1 | -1 | 1 |
| 1 | 1 | -1 | -1 | -1 |

$Z_1 = X_1$ AND NOT $X_2$.

$Z_2 = X_2$ AND NOT $X_1$




Alterernatery MCP (Binary)



ANS 4(c)

$X_1$

$\begin{pmatrix}1\\1\end{pmatrix}\begin{pmatrix}1\\3\end{pmatrix}$ } Belong to +ve class

$X_2$

$\begin{pmatrix}1\\-0.5\end{pmatrix}\begin{pmatrix}1\\-2\end{pmatrix}$ } Belong to -ve class

Let the weight vector $(w_0, w_1)$

hyperplane $W^T x_1$

Pattern 1 $\rightarrow (w_0, w_1)\begin{pmatrix}1\\1\end{pmatrix} = w_0 + w_1 = 0$

$\Rightarrow w_0 = -w_1$

$\rightarrow$ (+ve class)

pattern 2 $\rightarrow (w_0, w_1)\begin{pmatrix}1\\3\end{pmatrix} = w_0 = -3w_1$

$\rightarrow$ (+ve class)

pattern-3 $\rightarrow (w_0, w_1)\begin{pmatrix}1\\-0.5\end{pmatrix} \rightarrow w_0 = 0.5w_1 \rightarrow$ (-ve class)

pattern-4 $\rightarrow (w_0, w_1)\begin{pmatrix}1\\-2\end{pmatrix} \rightarrow w_0 = 2w_1 \rightarrow$ (-ve class)