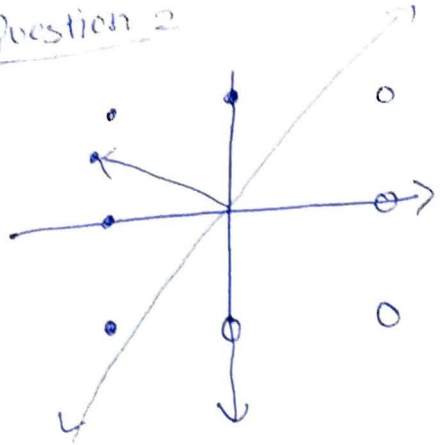
Question 2

a)



$y = 2x$ is a eqn of line

$\omega^T = [-2, 1]$ ie Normal to line we have taken from origin

eqn of Decision boundary $= \omega^T x + b$

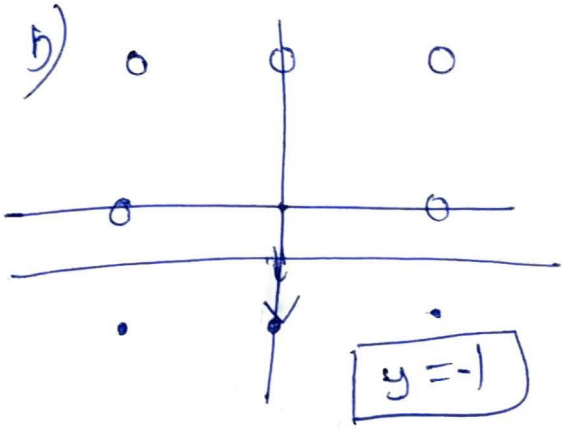
$x$, point of decision boundary

$b = -\omega^T x$

$b = -[-2, 1] \begin{bmatrix} 0 \\ 0 \end{bmatrix}$

$\boxed{b = 0}$

b)



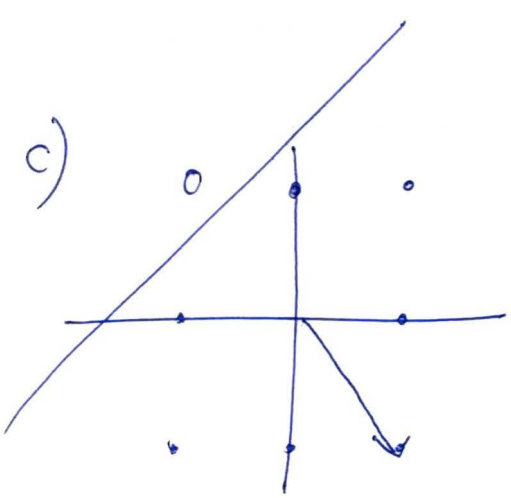
$y = -1$

$\omega^T = [0, -2]$ - weight vector they are normal to Decision boundary

$b = -\omega^T x$

$b = -[0, -2] \begin{bmatrix} 2 \\ -1 \end{bmatrix} = -2$

c)



$y = x + 1$

$\omega^T = [2, -2]$

$b = -\omega^T x$ $(-1, 2)$ x on decision bou

$b = -[2, -2] \begin{bmatrix} -1 \\ 2 \end{bmatrix}$

$= -(-2 - 4) 2 + 6$

$\boxed{\text{baisz } 6}$