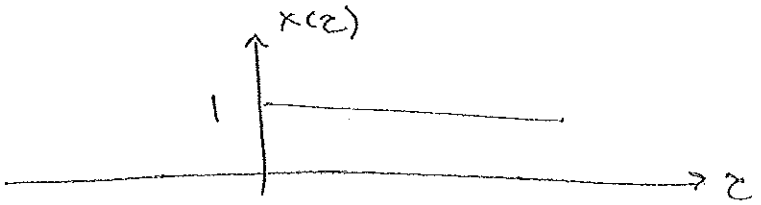
Question 3 (a)

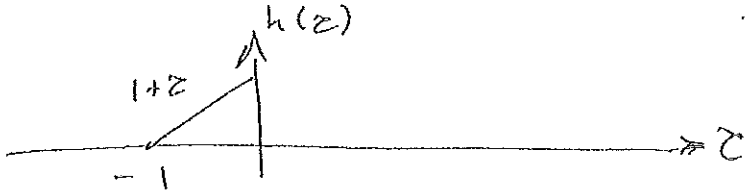
[1]

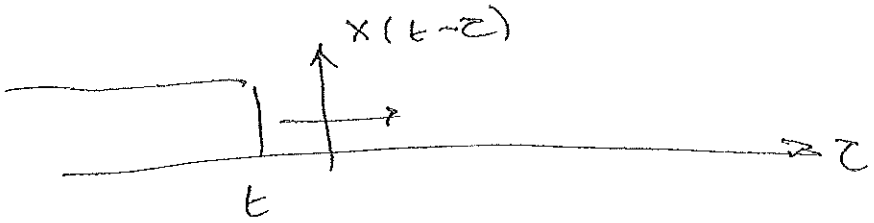
$x(t) = u(t)$

$$h(t) = \begin{cases} 0 & \text{elsewhere} \\ 1+t & -1 \le t \le 0 \end{cases}$$

$y(t) = \int_{-\infty}^{\infty} x(\tau) h(t-\tau)\, d\tau$ or $\int_{-\infty}^{\infty} h(\tau) x(t-\tau)\, d\tau$







(2)

$t < -1 \qquad y(t) = 0$

(2)

$-1 \le t \le 0 \qquad y(t) = \int_{-1}^{t} (1+\tau)\, d\tau = \tau + \frac{\tau^2}{2} \Big|_{-1}^{t}$

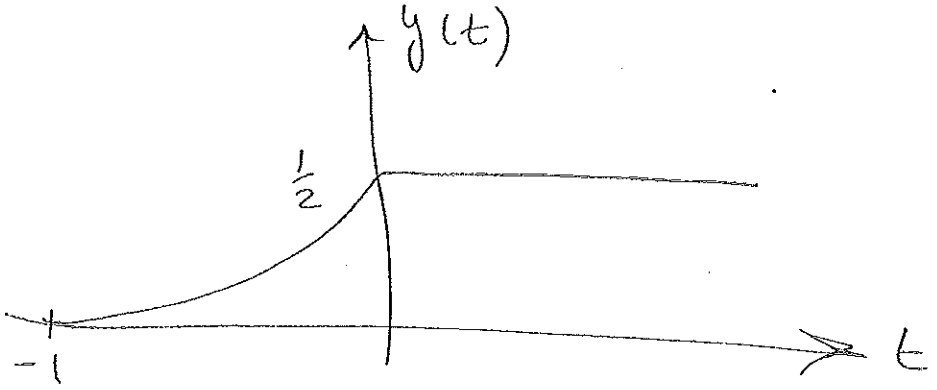
$= t + \frac{t^2}{2} + 1 - \frac{1}{2}$

(4)

$= \frac{1}{2} + t + \frac{t^2}{2}$

$t > 0 \qquad y(t) = \int_{-1}^{0} (1+\tau)\, d\tau = \frac{1}{2}$

(2)



(2)