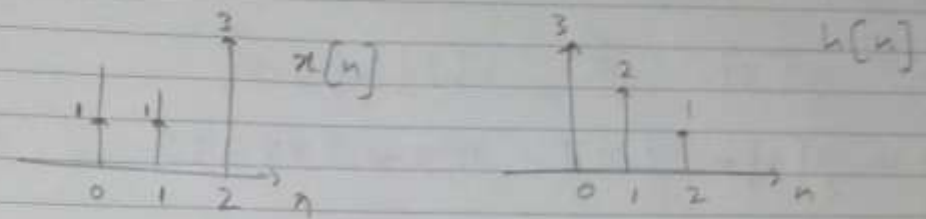


Name Zia Us Rehman
 ID 11473 Dept: BE(E)
 Sub: Signal and system

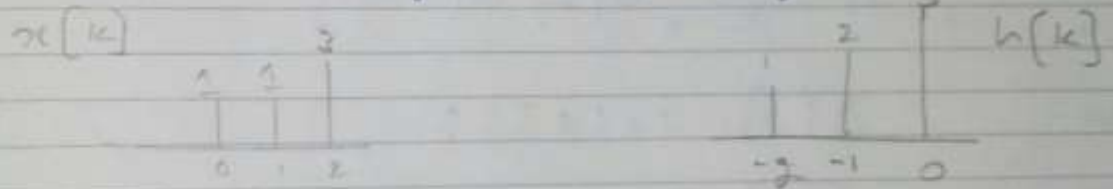
Q No 1: Convolution Summations

(a)



Solution:

Step 1 Folding of impulse response replacing "n" by "k"

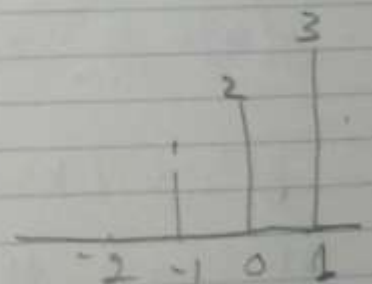


for $n=0$

$$y[0] = \sum_{k=-\infty}^{\infty} x[k] u[0-k]$$

$$y[0] = 1 \times 3 = 3$$

$$y[0] = 3$$



8 Tuesday 06/8/2018

8.00 am

At $n=1$

8.30

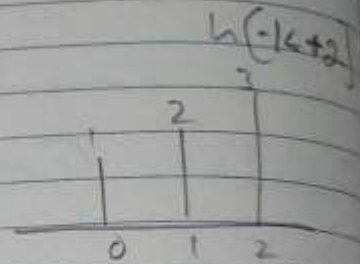
$$y[1] = \sum_{k=-\infty}^{\infty} x[k] h[1-k]$$

9.00

9.30

$$y[1] = 2 \times 1 + 3 \times 1 = 5$$

10.00



10.30

At $n=2$

11.00

$$y[2] = \sum_{k=-\infty}^{\infty} x[k] h[2-k]$$

11.30

$$y[2] = 1 \times 1 + 1 \times 2 + 3 \times 3 = 12$$



Noon

12.30

At $n=3$

1.00

$$y[3] = \sum_{k=-\infty}^{\infty} x[k] h[3-k]$$

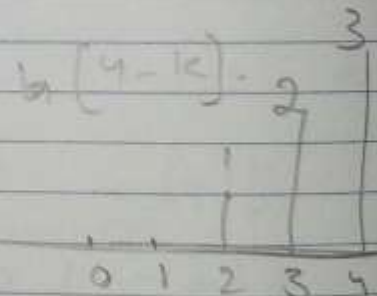
1.30

2.00

$$y[3] = 1 \times 1 + 3 \times 2$$

2.30

$$y[3] = 7$$



3.00

At $n=4$

3.30

$$y[4] = \sum_{k=-\infty}^{\infty} x[k] h[4-k]$$

4.00

4.30

$$y[4] = 1 \times 3 = 3$$

5.00

At $n > 4$ there is no overlap

8.00 am

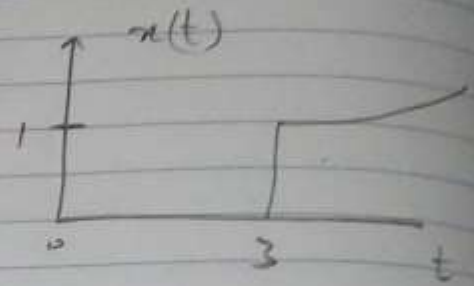
Q2
A

Sketch the transformed version of the signal $x(t)$ mentioned.

9.00

9.30

10.00



10.30

- i) $x(t+5)$ and $x(3t)$
- ii) $x(t/4)$ and $x(t-2)$

11.00

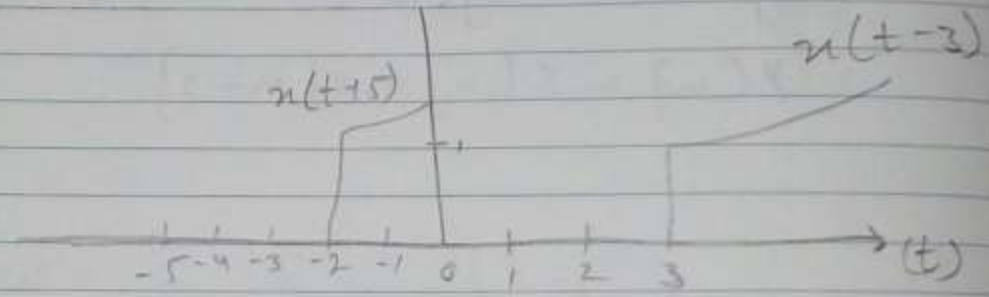
11.30

i) $\Rightarrow x(t+5)$ and $x(3t)$

Noon

12.30

1.00



1.30

2.00

This figure shows translation which is from right to left.

2.30

At $t=3$ $x(t)=1$
 At $t+5=3$ $x(t)=1$

3.00

$t = -5 + 3$

3.30

$t = -2$

4.00

4.30

5.00

8.00 am

P4.

07/1/2015 Friday 11

Compression $x(3t)$.

8.30

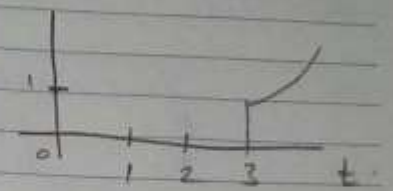
9.00

At $t=3$ $x(t)=1$
 At $3t=3$ $x(3t)=1$

9.30

$3t=3$
 $t=1$

10.00



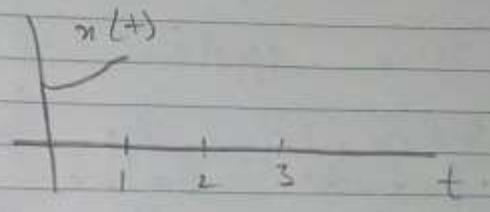
10.30

So $y(t) = x(t-3)$, $z(t) = x(3t)$.

11.00

11.30

Noon



12.30

(ii) $x(t/4)$ and $x(t-2)$

1.00

Expansion $x(t/4)$:-

1.30

At $t=3$ $x(t)=1$
 At $t/4=3$ $x(t/4)=1$

2.00

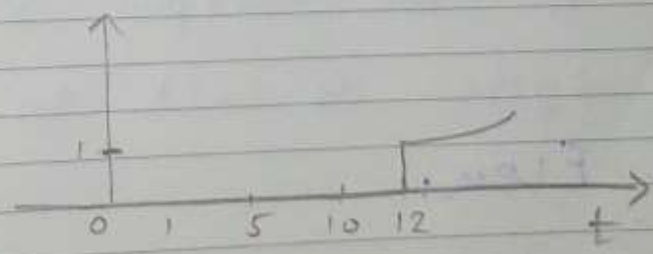
$t/4=3$ $t=12$

2.30

3.00

3.30

4.00



4.30

5.00

Time delay :-

$$x(t-2)$$

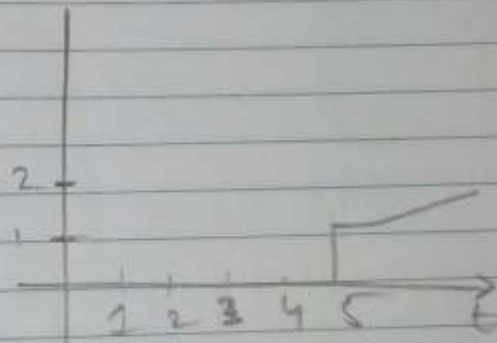
$$\text{At } t=3 \quad x(t)=1$$

$$\text{At } t-2=3 \quad x(t)=1$$

$$t = 2 + 3$$

$$\boxed{t=5}$$

So



8.00 am

Q No 2.

8.30

i) $y(n) = x^2(n)$.

9.00

B

This system is non-invertible

9.30

Because we cannot determine the sign of the input from the knowledge of output.

10.00

10.30

ii) $y(n) = x(n+2)$

11.00

This system is non-causal

11.30

Because its output involves future value of the input so its non-causal.

Noon

12.30

1.00

Q No 3

1.30

Answer:

2.00

If a time shift in the input signal results

2.30

in an identical time shift

3.00

in the output signal, the

3.30

system is said to be

4.00

Even:

4.30

|| ——— || ——— || ——— ||

5.00