ELM 367 Ödev 2 - 171024085 Ömer Konan

ELM 367 ÖDEV II

"Ödevi başka bir öğrenciden kopyalamadım. Kendim yaptım"

Ömer Konan 171024085

SORU 2)

12.a) $y[n] = n\,y[n-1] + x[n]$

$y[n] = 0 \quad n \geq 0$

$y[0] = 1$
$y[1] = 1$
$y[2] = 2$
$y[3] = 6$

$\Big\} \; y[n] = n!\,u[n]$

b) $x[n] = a + b$

$y[n] = 0 \quad n < 0$

$y[0] = a + b$
$y[1] = a + b$
$y[2] = 2(a+b)$

$\Big\}$ Linear

c) $x[n] = \delta[n-3]$

$y[n] = 0 \quad n < 0$
$y[0] = 0$
$y[1] = 1$
$y[2] = 2$
!

$h[n-3] = (n-3)!\,u[n-3] \neq y[n]_{x[n]=\delta[n-3]}$

Not time invariant

SORU 3)

18.a) $h[n] = (1/2)^n u[n]$

nedensel $\Rightarrow h[n] = 0 \quad n < 0$

b) $h[n] = (1/2)^{|n|}$

$h[n] \neq 0 \quad n < 0$ not causal

e) $h[n] = u[n+2] - u[n-2]$

$h[n] \neq 0 \Rightarrow n < 0$ not causal

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SORU 4)

19.a) $4^n u[n] = h[n]$

$n \to \infty$ $h[n]$ sonsuz

not stable

c) $h[n] = 3^n u[-n-3]$

$$\sum_{n=-\infty}^{-1} 3^n = 1 - \sum_{i=3}^{\infty} (1/3)^n$$

$$= 1 - \frac{1}{1-\frac{1}{3}} = \frac{1}{2}$$ stable.

e) $h[n] = (3/4)^{|n|} \cos(\pi n/4 + \pi/4)$

$n=3 = \cos(\pi/2) = 0$

$n=2 = \cos(3\pi/4) =$ stable.

$(3/4)^{|n|}$ = n'lira gidersen

SORU 5)

10 a) $y[n] = h[n] * x[n]$

$$= \sum_{k=-\infty}^{\infty} a^k u[-k-3]\, u[n-k]$$

$$= \begin{cases} \sum_{k=-\infty}^{\infty} a^k & n \le -3 \\ \sum_{k=-\infty}^{-3} a^k & n > -1 \end{cases}$$

$$= \begin{cases} \frac{a^n}{1-1/a} & n \le -1 \\ \frac{1/a}{1-1/a} & n > 1 \end{cases}$$

b) $u[n] = 2^n u[-n-3]$

$w[n] = u[n] * v[n] = \begin{cases} 2^{n+3} & n \le -3 \\ 1 & n > 3 \end{cases}$

$y[n] = w[n-4] * v[n]$

$= w[n-4]$

$= \begin{cases} 2^{n-3} & n \le 3 \\ 1 & n > 3 \end{cases}$

c) $h[n] = 2^{n-3} u[-(n-3)-3] = v[n-3]$

$y[n] = x[n] * h[n]$

$= x[n] * v[n-3]$

$= w[n-3]$

$= \begin{cases} 2^n & n \le 0 \\ 1 & n > 0 \end{cases}$