matias orsino

"T57: Transformada Z y RTA en frecuencia"

HOJA N°

FECHA

1. Hallar $T(z) = \frac{Y(z)}{X(z)}$

A. $y(n) = x(n-3) + x(n-2) + x(n-1) + x(n) \xrightarrow{Z}$

$A_0 Y(z) z^0 = B_3 X(z) z^{-3} + B_2 X(z) z^{-2} + B_1 X(z) z^{-1} + B_0 X(z) z^0 \xrightarrow{Z}$

$$T(z) = \frac{Y(z)}{X(z)} = \frac{1.z^0 + 1.z^{-1} + 1.z^{-2} + 1.z^{-3}}{1.z^0} = \frac{z^3 + z^2 + z^1 + 1}{z^3}$$

B. $y(n) = x(n-4) + x(n-3) + x(n-2) + x(n-1) + x \xrightarrow{Z}$

$A_0 Y(z).z^0 = B_4 X(z) z^{-4} + B_3 X(z) z^{-3} + B_2 X(z) z^{-2} + B_1 X(z) z^{-1} + B_0 X(z).z^0 \Rightarrow$

$$T(z) = \frac{1.z^0 + 1.z^{-1} + 1.z^{-2} + 1.z^{-3} + 1.z^{-4}}{1.z^0} = \frac{z^4 + z^3 + z^2 + z^1 + 1}{z^4}$$

C. $y(n) = x(n) - x(n-1) \xrightarrow{Z} A_0 Y(z) z^0 = B_0 X(z) z^0 - B_1 X(z) z^{-1} \Rightarrow$

$$T(z) = \frac{1.z^0 - 1.z^{-1}}{1.z^0} = \frac{z-1}{z}$$

D. $y(n) = x(n) - x(n-2) \xrightarrow{Z} A_0 Y(z) z^0 = B_0 X(z) z^0 - B_2 X(z) z^{-2} + B_1 X(z) z^{-1}$

$$T(z) = \frac{1.z^0 + 0.z^{-1} - 1.z^{-2}}{1.z^0} = \frac{z^2 - 1}{z^2}$$