Lect 1 Example. 1.6

Q. 求 discrete time. space model & transfer function

Solution X 先求 Φ，再在这个基础上求 G

$$[zI-A] = \begin{bmatrix} z & -1 \\ 0 & z \end{bmatrix}$$

$$[zI-A]^{-1} = \frac{1}{z^2}\begin{bmatrix} z & 1 \\ 0 & z \end{bmatrix} = \begin{bmatrix} \frac{1}{z} & \frac{1}{z^2} \\ 0 & \frac{1}{z} \end{bmatrix}$$

$$\frac{Y(z)}{U(z)} = C[zI-A]^{-1}B$$

$$= \begin{bmatrix} 1 & 0 \end{bmatrix}\begin{bmatrix} \frac{1}{z} & \frac{1}{z^2} \\ 0 & \frac{1}{z} \end{bmatrix}\begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

$$= \begin{bmatrix} \frac{1}{z} & \frac{1}{z^2} \end{bmatrix}\begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

$$= \frac{1}{z^2}$$

$$x((k+1)T) = \Phi(T)x(kT) + \theta(T)u(kT)$$

$$\Phi(T) = L^{-1}\{[sI-A]^{-1}\}$$