## recog: Saspenia sobre souted par

A Posticolory windowstand set of systems A Posticolor with some LTI are that are and those that are specified by where constant coeff differential & difference egn.

Solution's for linear constant coeff
elifferential equ are Particular sons
conditions.

When they do and don't corseipend to LTI system's?

 $\frac{\kappa=0}{2 \pi q_{K}} \frac{d + \kappa}{d \kappa} = \frac{q + \kappa}{q_{K} q_{K}}$   $\frac{q + \kappa}{q_{K} q_{K}} = \frac{q + \kappa}{q_{K} q_{K}}$ 

7th oxfor difference egg

$$\sum_{k=0}^{M} a_k y[n-k] = \sum_{k=0}^{M} b_k x[n-k]$$

This is Linear because its linear Coentsination of devisatives, not linear to Linear System.

consessioned to river shipmo Edu record ou revort not infact =) one fact one mill see this

or discusse time core

nth ordor

$$\sum_{K=0}^{N} a_K y_{M-K} = \sum_{K=0}^{N} b_K x_{M-K}$$

Linear Complination of delayed vertical of the output = Lincol Complianof de bayed versions of the vineut. Nyn ozigoù gizzenio com Criver X(4), if xp(4) satisfies the egn then we com add any other Soln which satisfies homogenou's Gdn (See of Acts) = 0 wn fact the differential ear 

in not a unique specification of the system. because of we have any solution yp(4) then we Car add to that soln any Other Soln which satisfies the Nornoge reaus Equ and sum of those two will likewise be a soln

The homogeneous solution to

Eg ar dr July =0 in of the

form yn(4): Aest

 $\leq Q_{K} A S_{K} e^{St} = 0$  k = 0

 $\sum_{N} a_{K} z_{K} = 0 \qquad N \qquad 20042 \quad C! \quad j=1'5''N$ 

Yn(H)= A1e S1E + A2e SLEX. - + ANE SNE

+ Linear System €) auxillary andition =0

\* Cousual, LTI (=) imitial xest,

if x (4) =0 (260

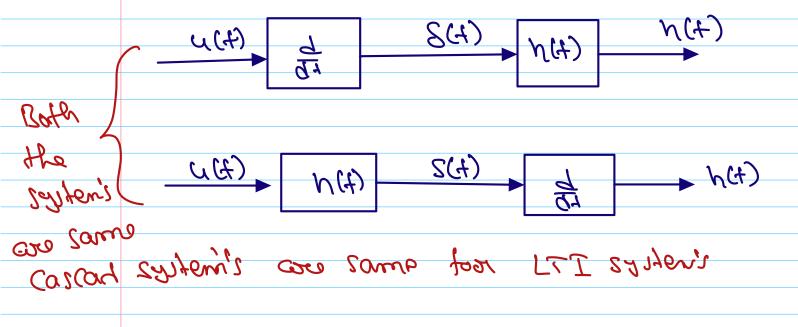
Example:

poerodouons coln:

" goess" 2" (4)= 462+

$$= 1 \quad \forall (0) = \left( A + \frac{k}{a} \right) = 0$$

4 for CTI system's viropulse zerronse



for the above example S(4): 1 (1-eat) ut)

$$h(t) = \frac{d}{dt} \left( \frac{1}{a} \left( n - e^{-\alpha t} \right) u(t) \right)$$

$$= \frac{d}{dt} \left( \frac{1}{a} \left( n - e^{-\alpha t} \right) u(t) \right)$$

$$= e^{-\alpha t} u(t) + \frac{1}{a} \left( n - e^{-\alpha t} \right) S(t)$$

$$= e^{-\alpha t} u(t)$$

$$= e^{-\alpha t} u(t)$$

$$= e^{-\alpha t} u(t)$$

$$= e^{-\alpha t} u(t)$$

difference en.

$$1000$$
 (Homosenous soln)

=) Linear Complination of delayed verticals of the out Pot = Linear Complination of delayed verticals at the wints.

y (m)= Yp(m)+ yn(m)

"SA = (v) NC "los vongo moti

N auxillory root's are

y(mo) > y(no-i) , y (no-s], .. y(no-N4)

Linear System ( ) auxillary anditioned

coursal, LTJ (=) initial next

on > u 0.5200 x 6

1(2)=0 ~\\no

Example:

9(m)-03(m-): x[m]

coural, LTI ( win't in) nest

y(m]= x (m)+ ay(m-i)

2 [m]= S[m] y(m)=0 m20

MMT: S[m] +a Mm-i]

M[m]=0 nco (anitial zell)

h6)= 86)+ ah(-1)

h60]= 1

N[1] = [[0] + a h[0] = a

Mes: 8[2] + ah[i]=a2

h(n)= an u(n)

Stable of acı

## Causal CTI

[m] → amu(m)

family of Solution's

8(n) - anu(n) + yn(n)

Jh(2)= 422

=) yn[n]- ayn[m-i]=0

=) AZN-042N-1=0

=) Z=a

=) Sn[n]: Aan

8 (n) → a~u(n)+ Aa~

Block diagram:

y (n): x(n)+ ag(n-i)

