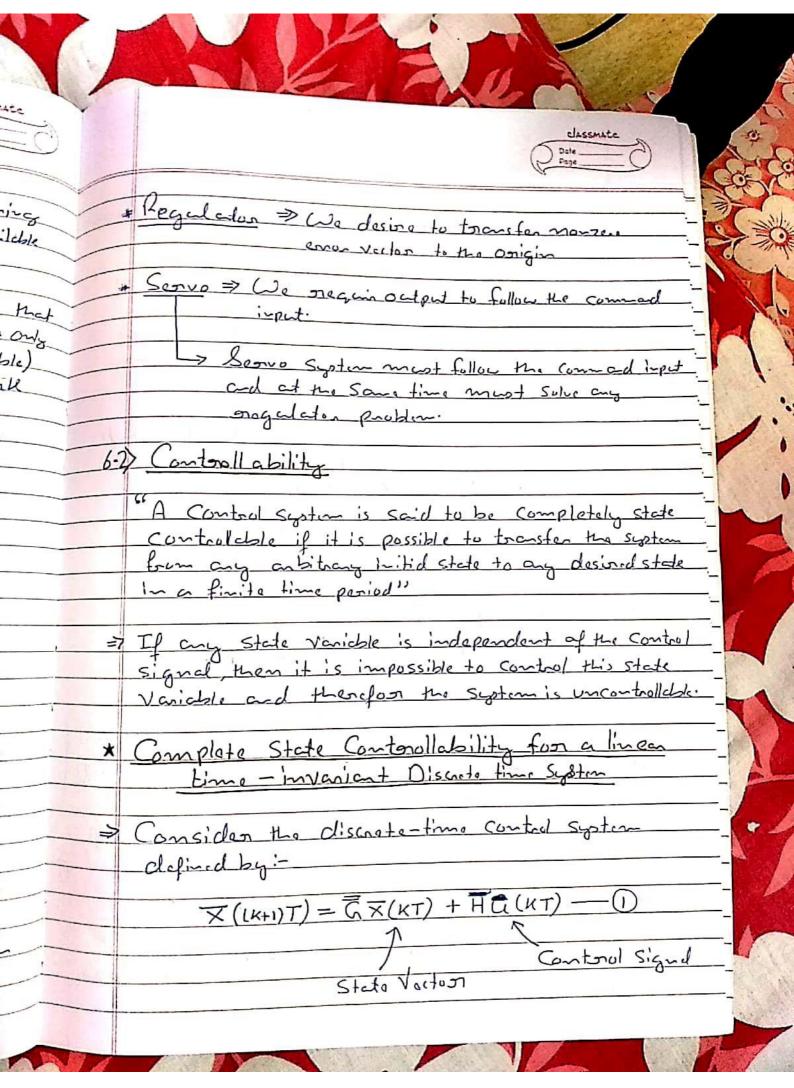
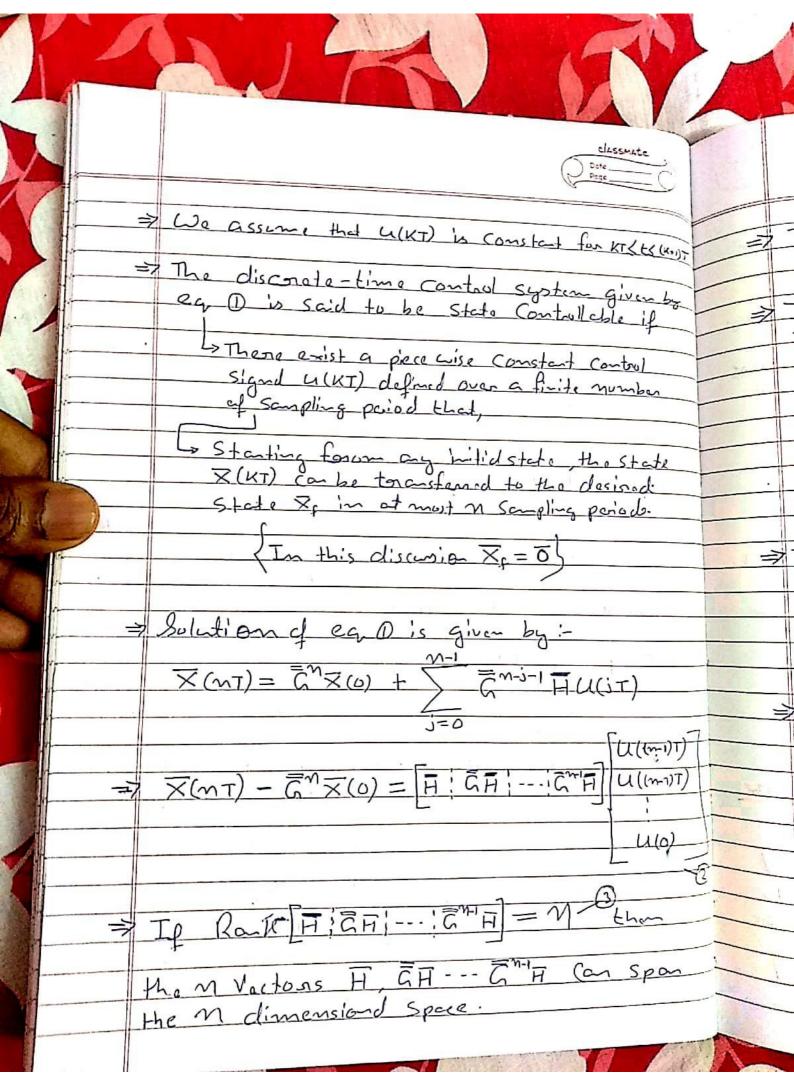
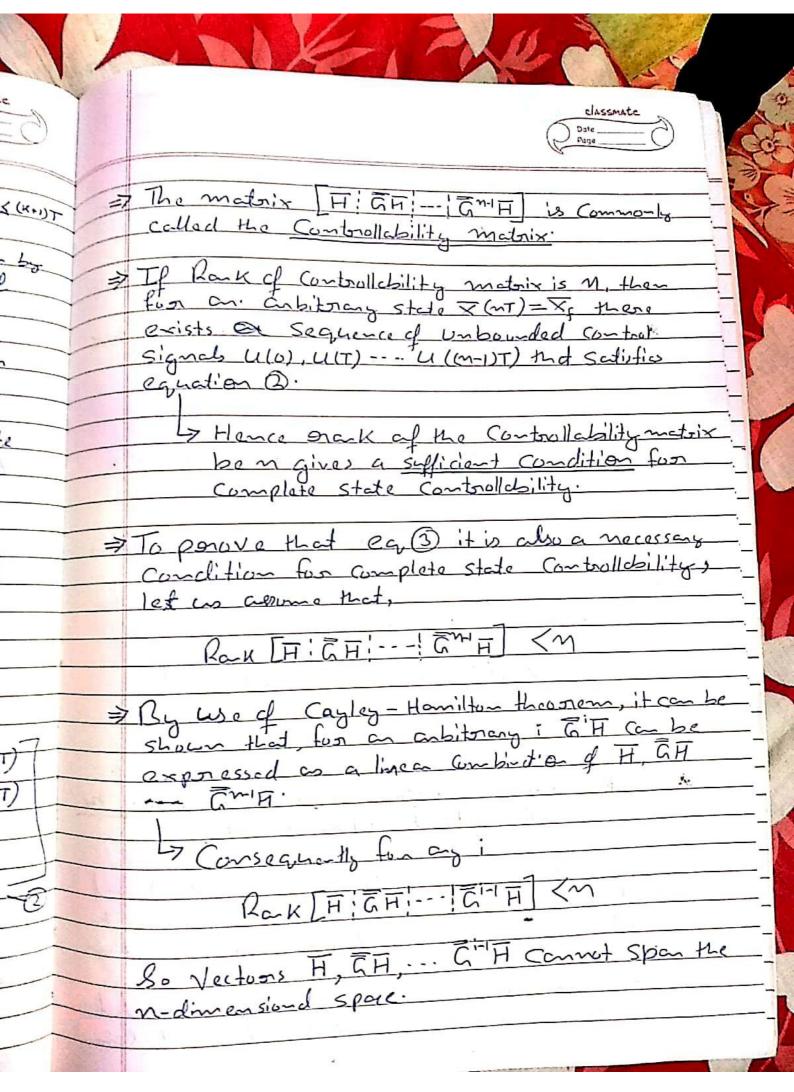
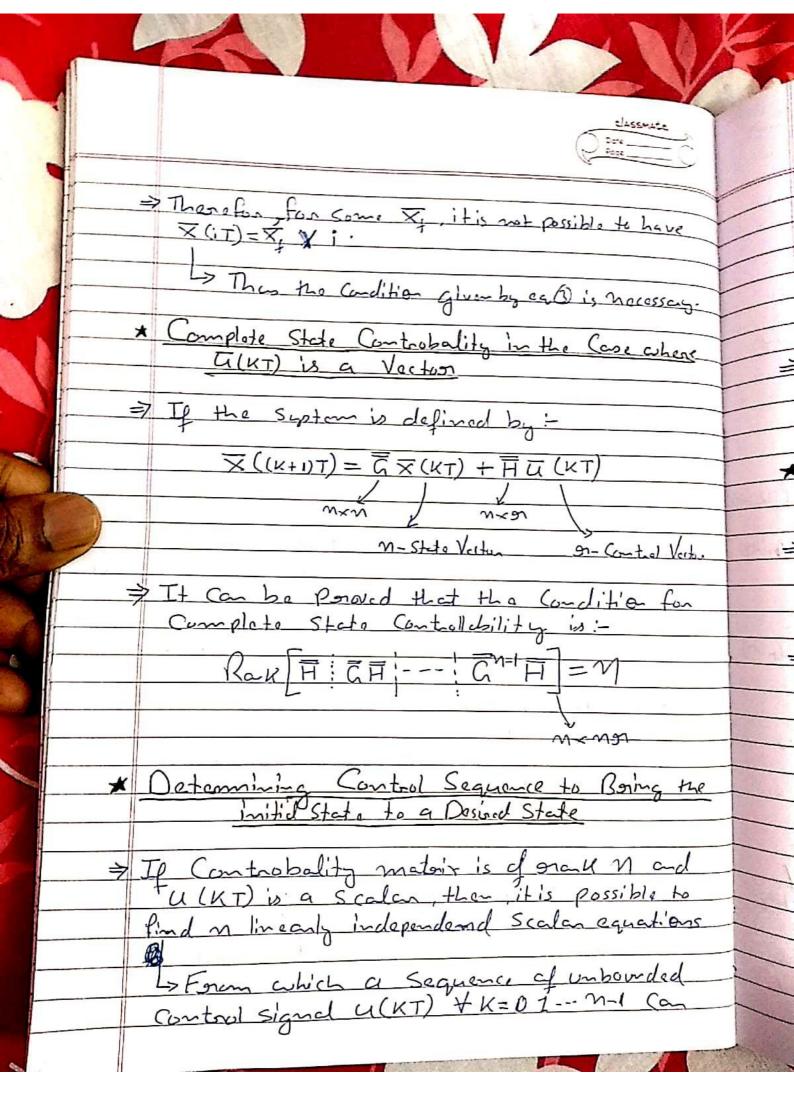
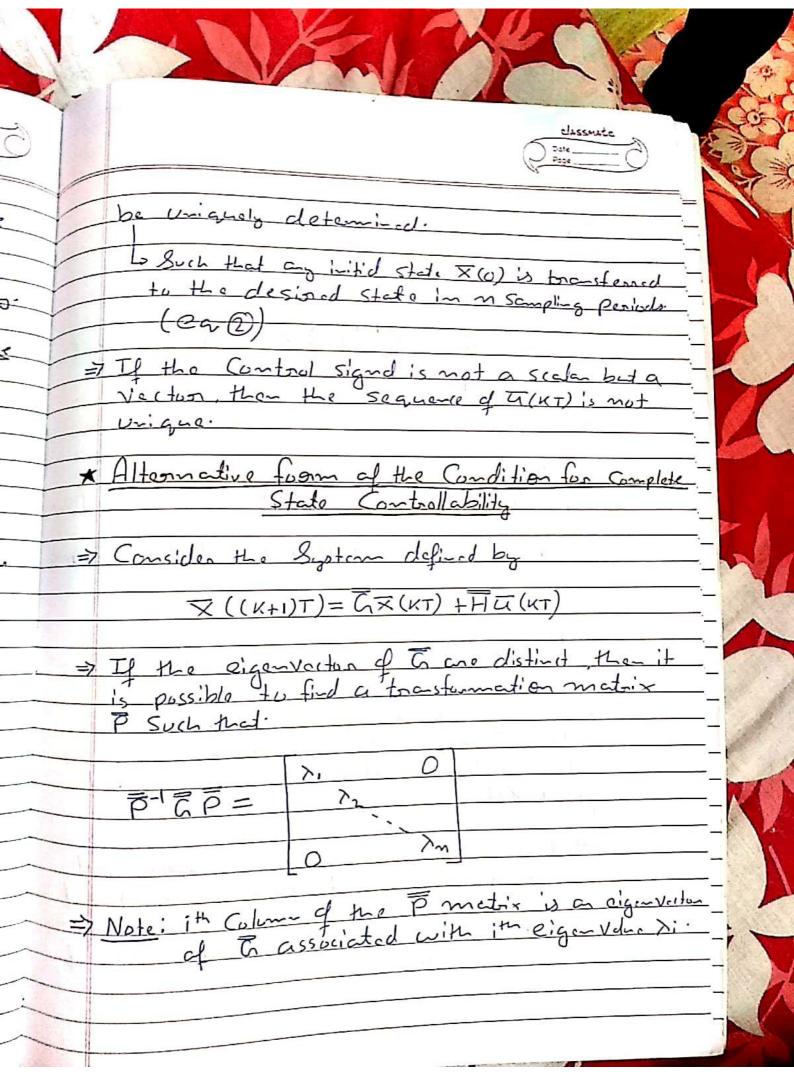
	N/S
classmate () thate they	
# First Phase: We design the System assuming that all state variables are available for food back.	4 (2
# Sacand Phase: We design the state Obsever hat	**
those that are not directly measurable) that are enagined for feedback to Complete design.	
· Disturbance are impulses that take place	6-2
• Effect of such impulses is to change the System State. So disturbance make be	
stepresented as an initial State.	=7
Specing between edjerent disturbances is Sufficiently wide that any mospouse to Such a disturbance Settels down before the most disturbance takes place.	*
(Regulator) (Cartal) Problem	
Both Control & Regulator problem boils down to the datermination of the desired state	
to the Catesmination of the house	

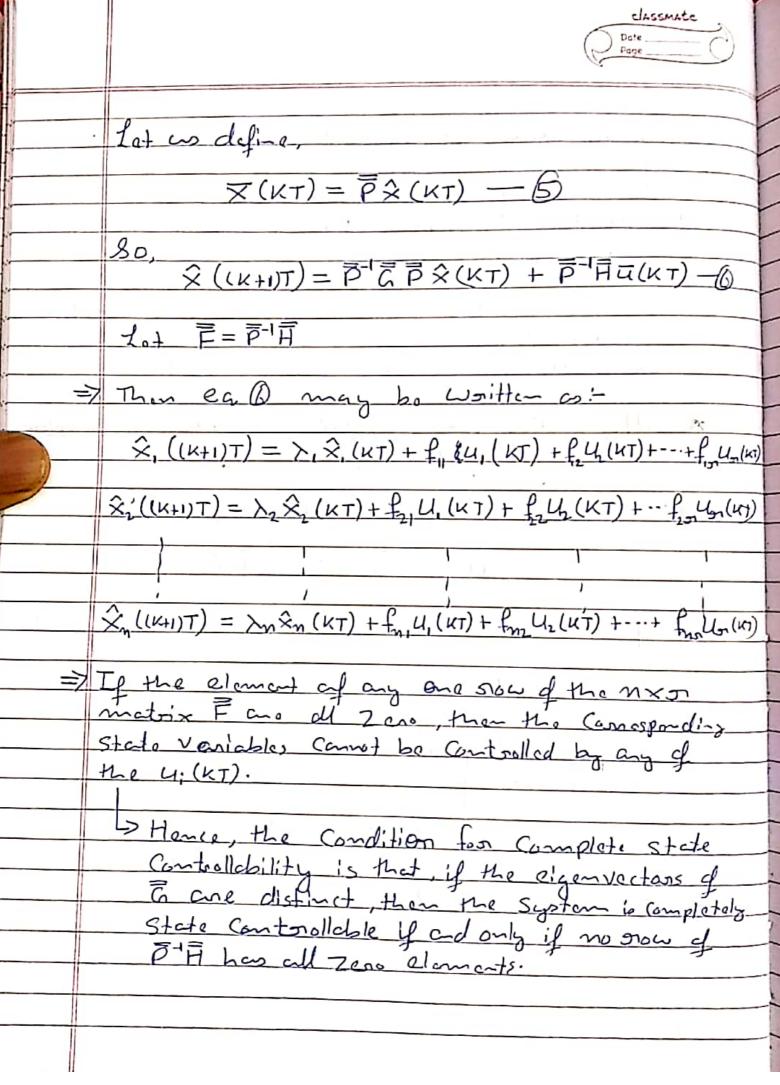


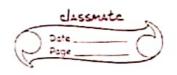












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T Con Cin	- 1 - P - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	
7 10000	nut diagonalizabl	la H h.
7		c inca we may
1 20 -5 1 20 - 5	1 1 - 0 - 1	
to tom	into a Jandan	Consoned I made
		COOLO MILON FOJOW.

J Suppose it is possible to find a transfer dia

II we define a now state Vactor & by

So, \$((K+1)T)= 5-125\$ (KT) + 5-17U(KT)

- => The System given by eq. (3) is Completely state
 Controllable if and only if:
 - (1) No tro Jondan blocks in J'are associated with the Same eigenvolve.
 - 4) Glame-to of any now of 5-1 Ti that Comispondo to the last sour of each Josedan Hock and not dl zeros:
 - (3) Elemens of each sow of 5-1 1/1 that Corresponds
 to distinct eigenvolue, are not zero.

×	Condition	for Com	plata State	Controllability
		i~ the Z.	-plone	,

"A Macassary and sufficient condition for Complete State Controllability is that no Concellation occure in the public torasta function.

The Concellation occure, the System Connot be Controlled in the direction of the Concelled mode.

* Complete Output Controllability

=> If poncitical design of a Control System we may want to control the output onthen than the State of the System.

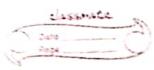
Me cessery mon Sufficient for Controlling the Output of the System.

=> Consider the System defined by the egudions

X((K+1)T)=GX(KT)+HU(KT) - 0

Y(KT)= CX(KT) -(10)

> The System defined by ear @ k(10) is said to be Completely output controllable, if it



1	is possible to construit on unconstrained
1	
/	Contail Signal Alkin Opinis OKKTKMT Such
/	number of Sampling periods OKKTKMT such
/	the cot
/	Is Stanting from any initial output 5(0), me
	Disput 5 (KT) Can be transferred to the
	- lesisce 001-1 4. 1-12. Desper
	must n Sampling periods.
	Solution of eag is:-
	<u> </u>
	$\overline{X}(\gamma) = \overline{C}^{M} \overline{X}(0) + \sum_{j=0}^{M-j-1} \overline{C}^{M-j-1} \overline{H}U(jT)$
	j=0
	= - (-)
	We have $\overline{y}(nT) = \overline{C} \times (nT)$
-	$\frac{\mathcal{G}(n\tau)}{\mathcal{G}(n\tau)} = \overline{\overline{C}} \overline{\overline{C}} \overline{X}(0) + \overline{\overline{C}} \overline{\overline{C}} \overline{\overline{C}} \overline{A}^{ij-1} \overline{H} u(i\tau)$
	4(MT) = (G X(O) + > CG HU(ST)
-	<u>j=0</u> [.(: \overline{y} -
	$\frac{1-\delta}{U(in-1)T}$
-	$\overline{G}(nT) - \overline{C}\overline{C}^{n} \times (0) = \overline{C}\overline{H}!\overline{C}\overline{L}H! - \cdots \overline{C}\overline{C}\overline{L}^{n}H U(mn)T)$
-	9(mT)-(h X0)=[
	U(0) -
-	1 11 1 condition for the
=7	A necessary and Sufficient condition for the
	System to be completely out Committee Com
	A necessary and Sufficient Controlchle is System to be completely output Controlchle is that Vectors CH, CGH CGM-IT Spas M-O
	Culput Spece.
	== NI [] M - M -
	Ran EH: EGH: CEMH = M - D
- market	13an L
-	

classmate
Date
> Next, Consider the system defined by the
equations:
$\overline{\chi}((\kappa+1)T) = \overline{\zeta} \times (\kappa T) + \overline{H} \overline{u}(\kappa T) - (1)$
G(NT) = (X(NT) + OG(NT) 0
U
A consider to Collisiant Condition for
H Macoss and suffer ac to be
the system defined by the theolights if in
A nocoss any & Sufficient Condition for the System defined by ear (1) & B to be Completely output Controllebo if:
Ronk [5: 27: 22] = M
Kank O; CH; Ch H;
6-3) Observability