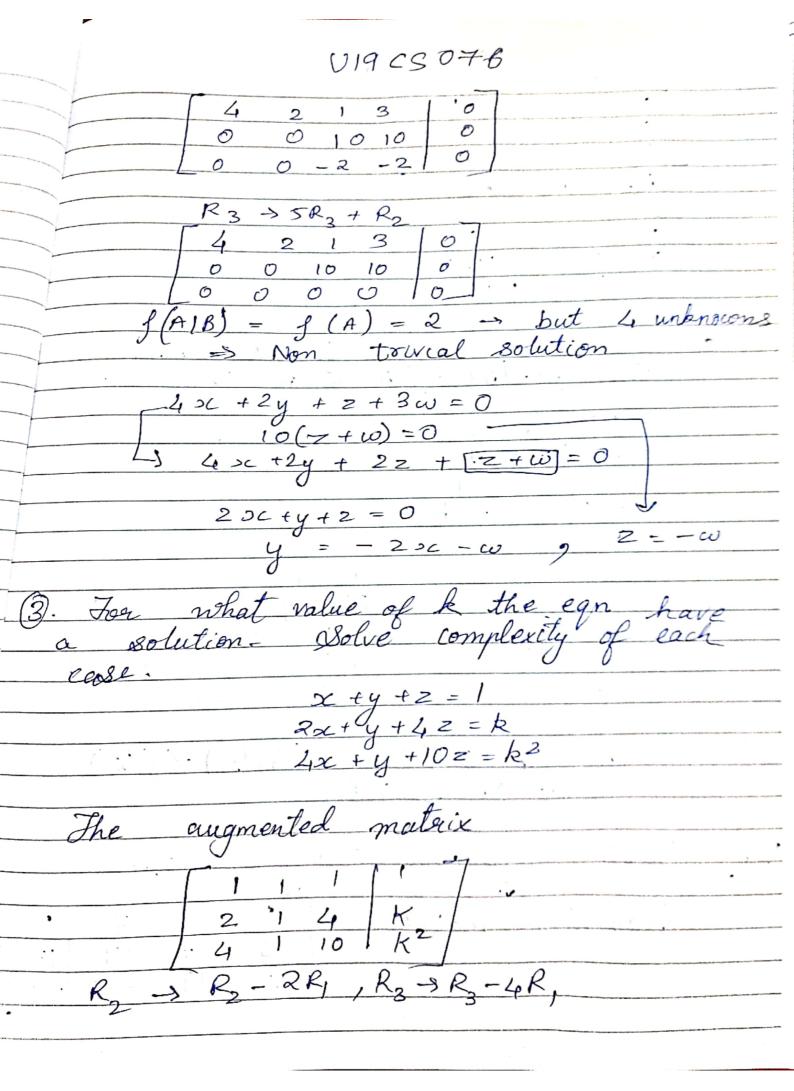
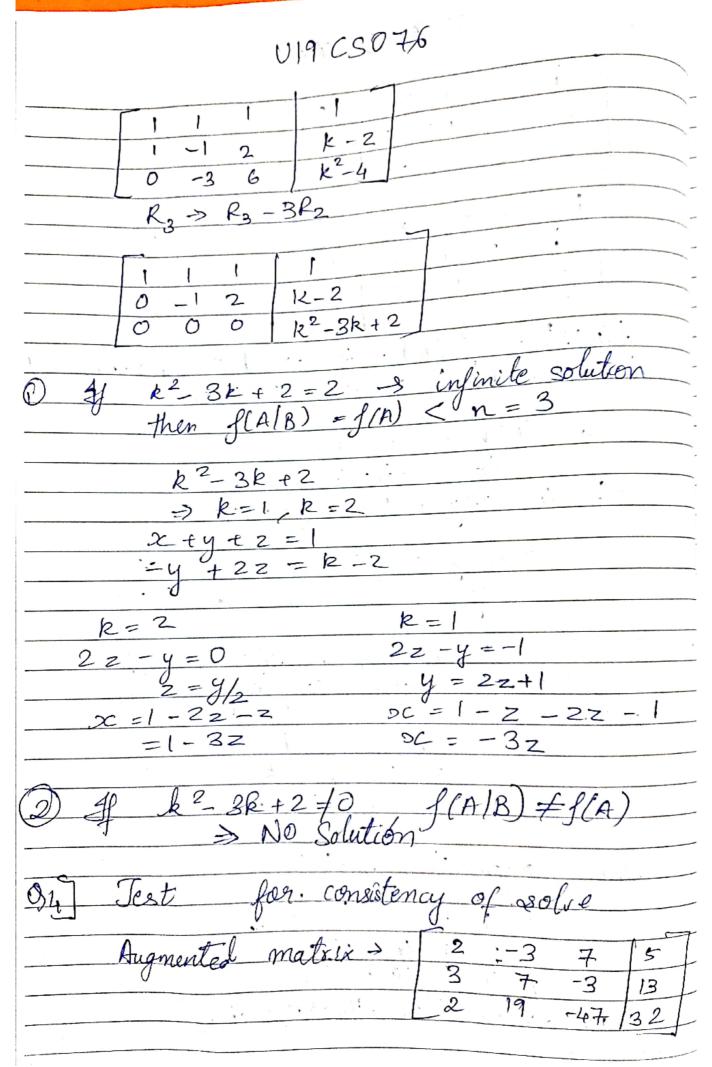
Linear Algebra and Statistical Analysis
Tutorial - 2
81 Test for consistency and solve them
1
$\frac{3c - 2y + 3t = 2}{2x + y + z + t = ' - 4}$ $\frac{4c - 3y + z + 7t = 8}{4c - 3y + z + 7t = 8}$
Augmented matrix. (AIB)
1 -2 0 3 2 2 1 1 1 -4 4 -3 1 7 8
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
2 2 1 -2 0 3 2 0 5 1 75 -8 8 5 1 -5 0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
(i) Augmented matrix

 $R_2 \rightarrow R_2 - 3R$ ,  $R_3 \rightarrow R_3 - 7R$ , J(A(B) = J(A) => 3 unknowns (Trivial solution  $\begin{array}{cccc}
2 & = 0 \\
-2y & = 0 \\
y & = 0
\end{array}$ Ly 0+0+0c,=0 Augmented matrix

R2 > 4R2-6R1/R3 > 4R3-2R1





$R_3 \rightarrow R_3 - R_1$ , $R_2 \rightarrow 2R_2 - 3R_1$ .
3 3 1
23 4 5
0 23 -27 11
0 22 -54 27
$R_3 \rightarrow R_3 - 2R_2$
0 23 -27 11 1
0 -24 0 5
f(A/B) - 3 = f(A)
f(A B) - 3 = f(A) $n = 3$ (unique solution)
2x - 3y + 7z = 5
02. 272 = 11
-24y = 5
-277 - 379
2 = 11 (48)
-2 t
$\left[z = -379/648\right]$ $\left[z = -379\right] + 3\left(-54\right)$
x = 5 - 7(-379) + 3(-379
2
x = 343
81
7 - 3 79
x = 343, $y = -5$ , $z = 648$
$=> x = \frac{343}{81}$ $= \frac{343}{24}$ $= \frac{648}{648}$
1

## V19 CS:076

11) 3 [1 2 1 3 ]
2 2 2 1 1 4 0
3 -5 5 2 . Augmented - matrix -
3 9 -1 4
$R_2 \rightarrow R_2 - 2R_1$ ; $R_3 \rightarrow R_3 - 3R_1$ ; $R_4 = R_4 - 3R_7$
2 1 3
0 1 2 -7
$R_3 \rightarrow R_3 - 11R_2$ ; $R_4 \rightarrow R_4 + 3R_2$
- 2 3
- 6024
$f(A B) = f(A) = 3 \rightarrow No. \text{ of unknown} = 3$
J (MB) June Mariocon -
Z=2.
$-y=-l \rightarrow y=l$
3 - 2 - 3
9c = 3 - 2 - 2
= = -1, y=1, z=2
25 Augmented matrix > (For finding values of a Sb)
1 107
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
153/9
and the state of t

$R_3 \rightarrow R_3 - 3R,  R_2 \rightarrow R_2 - 2R,$
-1 2 -2a 0 b-6.
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
LO 1+a 0 1-2(b-6)
The equation is consistent only when $a \neq -1$ There unique solutions
The equations are constent when a \( \frac{1}{2} \) b = any value
_ 86] Find value of I for which equations are
- 86 ] Find value of & for which equations are consistent.  - Tend value of & for where & has smallest of values. What happens when & has the
greatest values.
- writing the given equations in determinant
- form
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
2 3 1 1 1 -1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{vmatrix} \lambda - 1 & 4\lambda - 2 & \lambda + 3 \\ 2 & 3\lambda + 1 & 8\lambda + 3 \end{vmatrix} = 0$

U19 CS 076  $R_2 \rightarrow R_2 - \lambda_1$ ,  $R_3 \rightarrow R_3 - R_1$ Ca -> C2 + C3 From consistency -> true (1-1)(61-2) - (5/1+1) 2 612-21-61+2-(101+2) 62 - 18X =0 3 6x (x-3)=0 =3,1=0 minimum value of s 2=0 -DC+y=0, Tx=y For maximum value of  $\lambda$ ,  $\lambda = 3$  2x + 10y + 6z = 0, 2x + 10y + 6z = 0

Scanned with CamScanner