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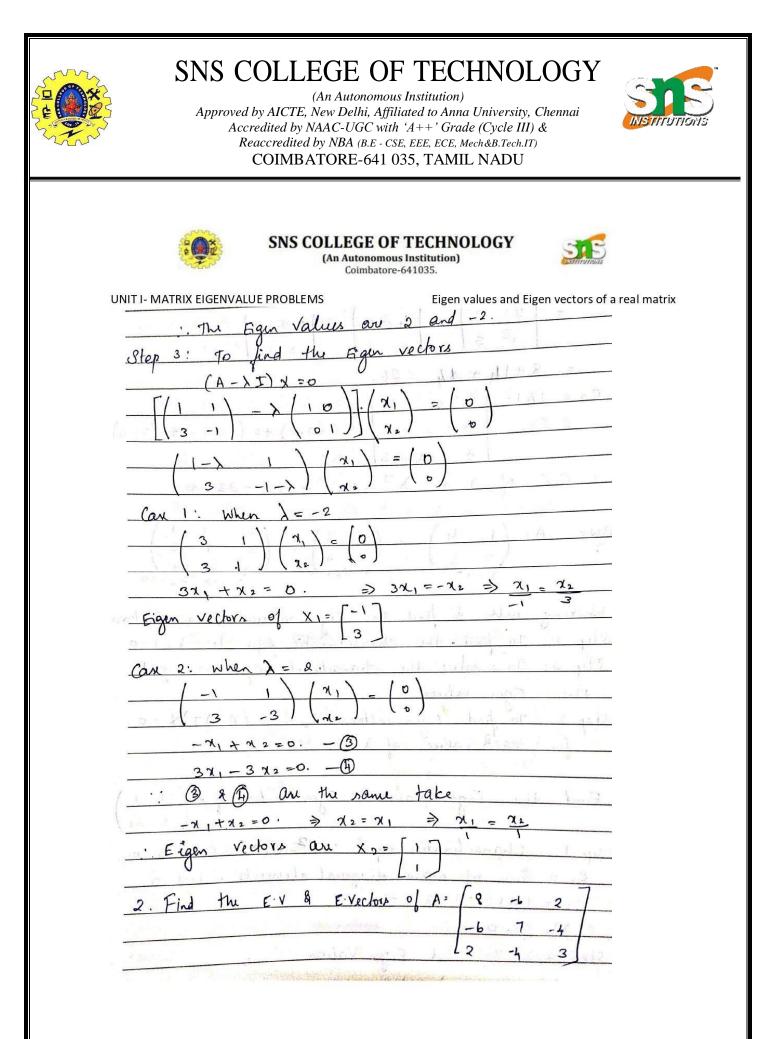


UNIT I- MATRIX EIGENVALUE PROBLEMS

Eigen values and Eigen vectors of a real matrix

1 Find	Ha.	Figure Na	lu 8	Galo	Vortora .	01 A=/	1.1
<u>In tres</u>	- K	Eigen va	1 8	J	1. Q14	0 (:	3 -1)
Step 1:	che	vacturistic	egn	: 12	- E, X -	+ C2 3 - 4	2 00.
C1 =	Sum	= -1-3 =	diag	onal el	ements	= 1-1=	0
C2 =	IAL	= -1-3 =	-4.	A B	A J M W	(t kin)	1.1
·. 22 -	- 4 =	0 -					
step 2		To find	Eigen 1	lalues.	<u>.</u>	un Role	
λ'	=4	=> 1 =	± 2.			and the second	

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TI-MATRIX EIGENVALUE PROBLEMS Stop 1: Characteristic eq.	Eigen values and Eigen vectors of a real n
1 ² -C12+C22-C3=0.	
C1= 8+7+3= 18	1 1 1
C2= Sun of minors of main	r diagonal els.
=] 7 -4] +] 8 2] +	4-13 2 8 -6]
-4 3 2 3	174-24 -1 71
	ting the second s
= 5 + 20 + 20 = 45	
C3 = 8 -6 2	
-67-4=8(5)	+6 (-10)+2(10)
2 -4 3 = 40 - 6	0+20=0. 45
. The C.E is \$3-18}2+45	λ=015-3
Step 2: EV $\lambda \left[\lambda^2 - 18 \lambda + 45 \right]$	=0. 0.1184.13-182
$\lambda = 0$, $\lambda = 3$, 15.	
. The Eigen values are	
Step 3: E. Vechors. (A-XI)X	20.
	217 0
	ka = 0
	(3 6 .
2 -4 37	1
18-2 -6 2 NI	
$\left(-6 7-2 -4 x_2 = \right)$	B PI CONTRACTOR
2 - 4 3-2 23	σ
12 4	7-
and When 2=0	
8x, -6x2+2x3=0 -0	-6 2 8 -6
-6x1+7x2-4x3=0-0	7 -4 -6 7
2x1 - 4 22 + 323=0-3 -	$\frac{\chi_1}{10} = \frac{\chi_2}{20} = \frac{\chi_3}{20}$
	a final transformer and the second
Considering O & @ by	pritting 3 we get



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JNIT I- MATRIX EIGENVALUE PROBLEMS $\chi_1 = -\chi_2 = \chi_3$	Eigen values and Eigen vectors of a real mat
<u> -6 2</u> 8 2 8 -6	Roll of Kills - 1
17-41 1-6-41 1-6-71	H STATISTICS
$\frac{3}{10} \frac{7}{10} \frac{-72}{-20} \frac{73}{20} \frac{3}{10} \frac{7}{10} =$	$\frac{\chi_2}{2} = \frac{\chi_3}{2}$
$\frac{1}{2} = \frac{1}{2}$	
Car 2: When X=3.	la a al ra
5-627[21][0]	
-6 4 -4 X2 = 0	E an G
L2 -4 0 [23] Lo]	- We do all all all all all all all all all al
$\frac{5\chi_{1}-6\chi_{2}+2\chi_{3}=0}{\chi_{1}}; -6\chi_{1}+4\chi_{2}-4\chi_{3}=$	=0; 211-4×2 +0×3=0 ×3
-6 2 S + &	5 -6
4-4 -6 -4	1-6 4
$\frac{\chi_1}{16} = \frac{-\chi_2}{-8} = \frac{\chi_3}{-16}$	$\frac{1}{2} = \frac{\chi_2}{1} = \frac{\chi_3}{-2}$
$\begin{array}{c} X_{2} = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$	o al vi i = = ./
Car 3 ! kihen 2=15	and I and the second
$\begin{bmatrix} -7 & -6 & 2 \end{bmatrix} \begin{bmatrix} 7 \\ 7 \end{bmatrix} \begin{bmatrix} 6 \end{bmatrix}$	1 rent all all
-6 -8 -4 = 0	and the second
2 -4 -12 L x3 Lo	and the second se
-7x1-6x2+2x3=0 3 -6x1-8x	2-423=0, 221-422-1223=0
$\chi_1 = -\chi_2 = \chi_1$	
1-62 1-72	-7 ~ b
-8 -4 -6 -4 -	6 - 8

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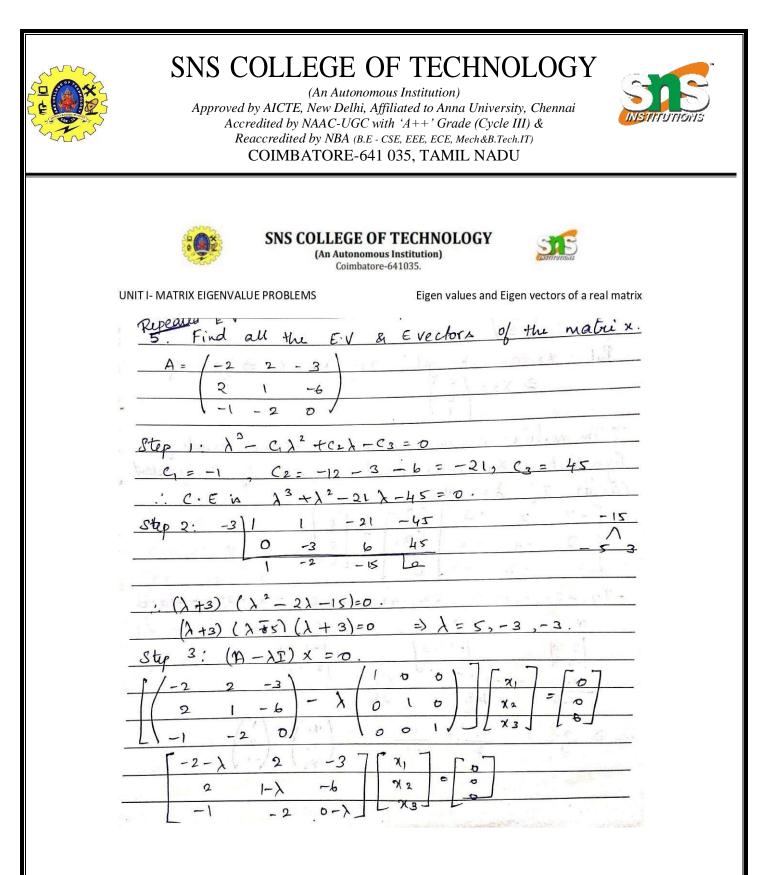


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NIT I- MATRIX EIGENVALUE F			Eigen	values and	l Eigen vecto	rs of a real matrix
<u></u> =	- 22	= X3	E	x x	= X2	= 73
	40	20	/31	2	-2	1
×3= 2	K K	, k.g.		L	112	e de la
		$\geq k^*$		34		· · · · · ·
Concluxon:		a [a]		- 01		1
Characteristic	lq.	E·V		2 0	Eigen	Vectors
λ ³ -18λ ² +45λ=	20	7=0	1.1.1		0 (2)
		$\lambda = 3$	5	¢	(2)	2)
	17	$\lambda = 1$	5		1-2	-2
		100 au 14		S. P	5 m. 1	

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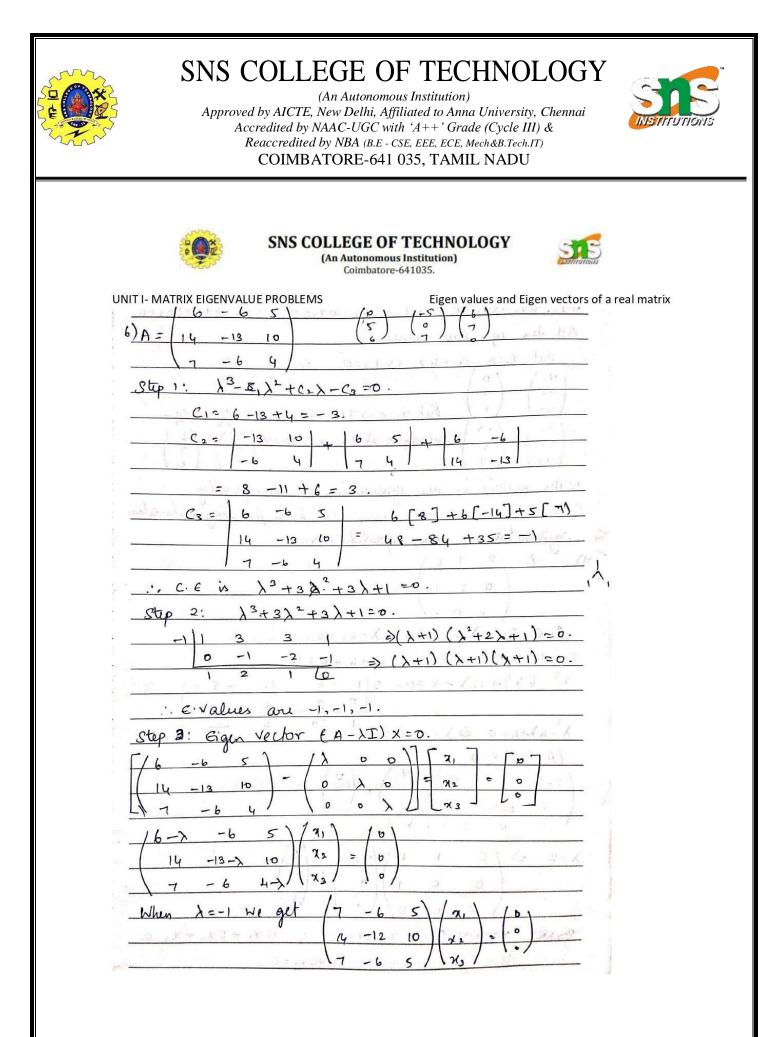
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JNIT I- MATRIX EIGENVALUE PROBLEMS	Eigen values and Eigen vectors of a real matrix
Can i) If A=-3, then.	с ¬
-12 - 3 - 1	0
-1 -2 3 - 2 3 -	
$\chi_1 + 2\chi_2 - 3\chi_3 = 0; 2\chi_1 + 4\chi_3$	$x - 6x = 0$; $-x_1 - 2x_2 + 3x_3$
Alt ax 2 - 3X3 = 0.	111. 1 11. 11
$Put X_1 = 0 \implies QX_2 = 3X_3$	$\Rightarrow \chi_{2} = \chi_{3}$
	3 2
	in the local stand
Put x2=0., we get x1	-3x3= 0 = x1 = x2
$\Rightarrow X_2 = \begin{pmatrix} 3 \\ - \end{array}$	3 1
	8 9
	tric the corresponding
Eigen Vectors X, & X2 nust	be Linearly Independent
Cartic) If 2=5, then.	
	0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20-
-7x, +2x2-3x3=0; 2x1-4x2-6	xx=D: -X,-2x,
$n(1) = -x_2 = =$	
2-3 -7-3	1-7 2]
$\frac{1-4-4}{2} = -22 = -23$	[2 -4]
-24 48 24	1 - 1





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UNIT I- MATRIX EIGENVALUE PROBLEMS $- \sqrt{3} - \sqrt{3} + \sqrt{3} = 0$	Eigen values and Eigen vectors of a real matrix $10 \chi_3 = 0$; $- \chi_1 - 6 \chi_2 + 5 \chi_3 = 0$
All the eqs are same.	DI S. ULLEACS
Put x1=0 => -6x2+5x3=0	=> X2 = X3
$\left(\frac{1}{2} \right) = \left(\frac{1}{2} \right)$	5 6
$\begin{pmatrix} \pi_2 \\ \pi_3 \end{pmatrix} \begin{pmatrix} s \\ 6 \end{pmatrix} \text{Put } \chi_2 = p \Rightarrow 7\chi$	1+5×3=0 => ×1 = ×3
$\frac{(\chi_1)}{(\chi_2)} = \begin{pmatrix} -S \\ b \\ T \end{pmatrix} But \chi_3 = 0 \Rightarrow T\chi$	$\begin{array}{c} -6\chi_{2}=0 \Rightarrow \begin{pmatrix} \chi_{1} \\ \chi_{2} \\ \chi_{2} \end{pmatrix} = \begin{pmatrix} h \\ \eta \\ \eta \end{pmatrix}$
. The matrix is non-symmetri E. Vectors X, X2 & X3 must	