1) i)
$$\begin{pmatrix} a^2 & ab \\ ab & b^2 \end{pmatrix}$$

$$= 0$$

$$|\hat{u}| |\cos d - \sin \alpha| = \cos^2 d - (-\sin^2 d)$$

$$|\sin \alpha| \cos d = 1$$

$$= 6 - 2^{2} - 32^{2} + 2^{3} + 2^{3} - 22^{2}$$

$$= 22^{3} - 62^{2} + 6 \rightarrow And$$

iv) | 1 | 1 | 1
$$(bc^2-cb^2)-a(c^2-b^2)$$

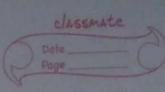
| $a b c + a^2(c-b)$
| $a^2b^2c^2$
= $bc^2-cb^2-ac^2+ab^2+a^2c-a^2b$

$$= a \left[b(cd+1) + 1(d) \right]$$

$$+ 1 \left[cd+1 \right) + 1(0) \right]$$

$$= [abcd + a + ad + cd + i]$$
2)i) $2n_1 - \frac{1}{2}n_2 - \frac{1}{2}n_3 = 0$

- /24 + 212 - 1/224 = 3



$$R_3 \rightarrow R_3 24 - 242 - 242 = 0$$
 $-242 + 22 - 242 = 3/2$

$$a_2 = 2$$
 . Ans $\Rightarrow 10$ [1, 2, 2, 1]

2) ii)
$$2\pi i + 3\pi_2 + 5\pi_3 + \pi_4 = 3$$

 $3\pi_4 + 4\pi_2 + 2\pi_3 + 3\pi_4 = -2$
 $\pi_4 + 2\pi_2 + 8\pi_3 - \pi_4 = 8$
 $7\pi_4 + 9\pi_2 + \pi_3 + 8\pi_4 = 0$

1	2	3	5	1	3	1
	3	4	2	3	-2	
	1	2	8	-1	8	
	7	9	1	8	0	

Ry > R2-R1

2	3	5	+1	3
1	1	-3	2	-5
1	2	8	-1	8
7	9	15	8	0

R3 -> R3 - R1

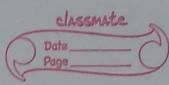
2	3	5	1	3
+1	+1	-3	+2	-5
-1	-1	3	-2	3
L7	9	1	8	0

R3 > R3 + R2

2	3	5	1	3
1	1	-3	2	-5
0	0	0	0	0
7	9	1	8	0

:. These equations have a solutions

(6

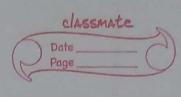


$$= \begin{bmatrix} 3 \\ 3 \end{bmatrix} \times 1/2$$

5) i) 6 False

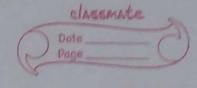
Let
$$A = \begin{bmatrix} 2 & 4 \\ 1 & 2 \end{bmatrix}$$
 $\begin{bmatrix} 3 & 6 \end{bmatrix}$

A&B are both not in vertible



$$(AB)(AB^{-1}) \neq I$$
Let $B = \begin{bmatrix} 3 & 2 \\ -2 & 8 \end{bmatrix}$

$$A = \begin{bmatrix} 2 & 4 \\ 1 & 2 \end{bmatrix}$$



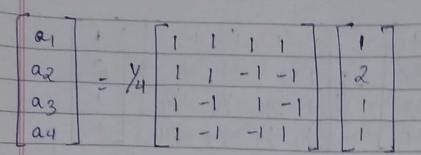
$$kA = B$$

$$BB^{-1} = B(kA)(kA)^{-1}$$

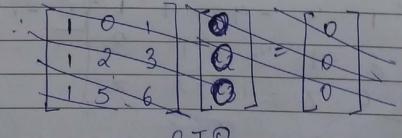
where and + and + and 3 + and y = d a, az, az, ay > constante

ai		1	1	1	1		1
az	=	1	1	1-1	-1	8	2
az		1	-1	1	- 1		1
,94		_ 1	-1	-1	1		1
			110	14			-



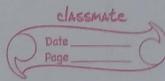


for linear independency.



P.T.0





1	0	1-	10]	
1	@ 2	3	0	
1	5	6	0	

 $R_3 \rightarrow R_3 - R_1$

1	0	1	0
1	2	3	0
0	5	5	0

R2 -> R2-R1

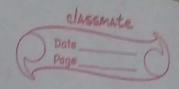
R2 + R2/2

Rg > Rg - ORa Ra > R2 - R1

$$a_1 + a_3 = 0$$
 $a_2 + a_3 = 0$
 $5a_2 + 5a_3 = 0$

=> ay = az = az = 0 => dy, dz & dz are linearly idependent.

$$R_1 \rightarrow R_1 - R_2$$



$$P = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}, N = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}, Q = \begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix}$$

$$PAQ = \begin{bmatrix} 2 & -3 \\ 1 & -2 \end{bmatrix} \begin{bmatrix} 2-3 \\ -12 \end{bmatrix}$$

$$A = \begin{bmatrix} 7 & -12 \\ 4 & -7 \end{bmatrix}$$

$$A^{\alpha} = \begin{bmatrix} 7 & -12 & 7 & -12 \\ 4 & -7 & 4 & -7 \end{bmatrix}$$

$$R_1 \rightarrow R_1 - R_2 + R_3$$

R1 > /2 R1

After transformation it implies that for (S,+S2), (S2+S3), (S3+S1) to be independent . S1, S2 & S3 has to be linearly independent.