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Section :- BS (Software Eng)

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- Where is mount Arab (Alba
- The Conquest of happiness

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Q.

$$\left[\begin{array}{cccc|c} 1 & 7 & 3 & 0 & 5 \\ 0 & 1 & 4 & 0 & 7 \\ 0 & 0 & 1 & 0 & -6 \\ 0 & 0 & 0 & 1 & 7 \end{array}\right] \quad R_1 - 7R_3$$

$$\left[\begin{array}{cccc|c} 1 & 0 & -4 & -7 & -35 \\ 0 & 1 & 4 & 0 & 7 \\ 0 & 0 & 1 & 0 & -6 \\ 0 & 0 & 0 & 1 & 7 \end{array}\right] \quad \begin{array}{l} R_1 - 4R_3 \\ R_2 - 4R_3 \end{array}$$

$$\left[\begin{array}{cccc|c} 1 & 0 & 0 & -7 & 59 \\ 0 & 1 & 0 & 0 & 31 \\ 0 & 0 & 1 & 0 & -6 \\ 0 & 0 & 0 & 1 & 7 \end{array}\right] \quad R_1 + 7R_4$$

$$\left[\begin{array}{cccc|c} 1 & 0 & 0 & 0 & 108 \\ 0 & 1 & 0 & 0 & 31 \\ 0 & 0 & 1 & 0 & -6 \\ 0 & 0 & 0 & 1 & 7 \end{array}\right] \quad \text{Ans}$$

So the number of Row in e
0 by 0 is called reduce
echelon fo

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day elaborate (b

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Q) 2 Part (a)

The elementary row operation that transform the 1st matrix to 2nd is $R_3 - 2R_2$ i.e

$$\begin{bmatrix} 1 & 3 & -1 & 5 \\ 0 & 1 & -4 & 2 \\ 0 & 2 & -5 & -1 \end{bmatrix}$$

R

$$\begin{bmatrix} 1 & 3 & -1 & 5 \\ 0 & 1 & -4 & 2 \\ 0 & 0 & 3 & -5 \end{bmatrix} \quad R_3 - 2R_2$$

and for the 2nd to 1st is $R_3 + 2R$

Part (b)

$$\begin{bmatrix} e & 0 & 0 & 0 \\ 0 & \bar{\Lambda} & 0 & 0 \\ 0 & 0 & -\bar{\Lambda} & 0 \\ 0 & 0 & 0 & e \end{bmatrix}$$ is in echelon form

Yes in echelon form because no Zero increase as we goes down by row before 1st non. zero

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Q2(b) $\begin{bmatrix} 1 & 0 & \text{II} \\ 0 & 1 & e \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ is in echelon form

yes in echelon form because number of Zero increase row by row before 1st non-zero.

c. $\begin{bmatrix} 5 & 0 & 0 & 7 \\ 0 & 1 & 0 & 5 \\ 0 & 0 & 1 & 4 \end{bmatrix}$ is in reduced row echelon form

N/o because the 1st element in R_1 in C_1 is not 1 so not in reduce echelon form.

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Q: Part 1

Row Echelon form:- A matrix is said to be in row (column) echelon form when it satisfies the following conditions.

(1) The first non-zero element in each row leading entry is 1
(2) Each leading entry is in a row to the right of the leading entry in the previous row.
(3) Rows with all zero elements if any are below (after) the row. a non-zero element

For example

$$\begin{bmatrix} 1 & 4 & 6 \\ 0 & 0 & 2 \\ 0 & 0 & 4 \end{bmatrix}$$

Q3 Part A

Reduce Row Echelon form

- A Matrix is said to be in reduced row echelon form when it satisfies following condition
- The Matrix satisfies condition for a row echelon form.
- The leading entry in each row is the only non-zero entry in its row

For example

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

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Q3 (b) Find an echelon form for the below matrix using row operation

$$\begin{bmatrix} 1 & 5 & 8 \\ 2 & 8 & -1 \\ -7 & 0 & 0 \\ 1 & -4 & 14 \end{bmatrix} \quad R_3 + 7R_4$$

$$\begin{bmatrix} 1 & 5 & 8 \\ 2 & 8 & -1 \\ 0 & 0 & 0 \\ 1 & -4 & 14 \end{bmatrix} \quad R_3 \leftrightarrow R_4$$

$$\begin{bmatrix} 1 & 5 & 8 \\ 2 & 8 & -1 \\ 1 & -4 & 14 \\ 0 & 0 & 0 \end{bmatrix} \quad R_2 - 2R_3$$

$$\begin{bmatrix} 1 & 5 & 8 \\ 0 & 0 & -29 \\ 1 & -4 & 14 \\ 0 & 0 & 0 \end{bmatrix} = \begin{bmatrix} 1 & 5 & 8 \\ 0 & 0 & -29 \\ 0 & -9 & 6 \\ 0 & 0 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 5 & 8 \\ 0 & -9 & 6 \\ 0 & 0 & -29 \\ 0 & 0 & 0 \end{bmatrix}$$

And Echelon form