

## JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE

Year & Sem – I Year & II Sem Subject – Engineering Mathematics-II Unit – I Presented by – (Dr.Vishal Saxena, Associate Professor)





## VISION AND MISSION OF INSTITUTE

### **VISION OF INSTITUTE**

To became a renowned centre of outcome based learning and work towards academic professional, cultural and social enrichment of the lives of individuals and communities.

## **MISSION OF INSTITUTE**

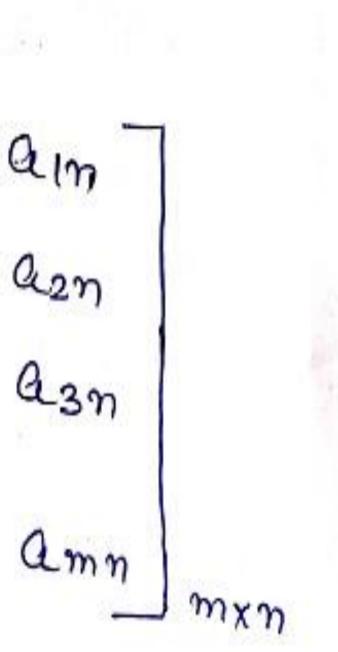
- Focus on evaluation of learning, outcomes and motivate students to research aptitude by project based learning.
- Identify based on informed perception of Indian, regional and global needs, the area of focus and provide platform to gain knowledge and solutions.
- Offer opportunities for interaction between academic and industry .
- Develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders may emerge.

# CONTENTS (TO BE COVERED)

# MATRICES

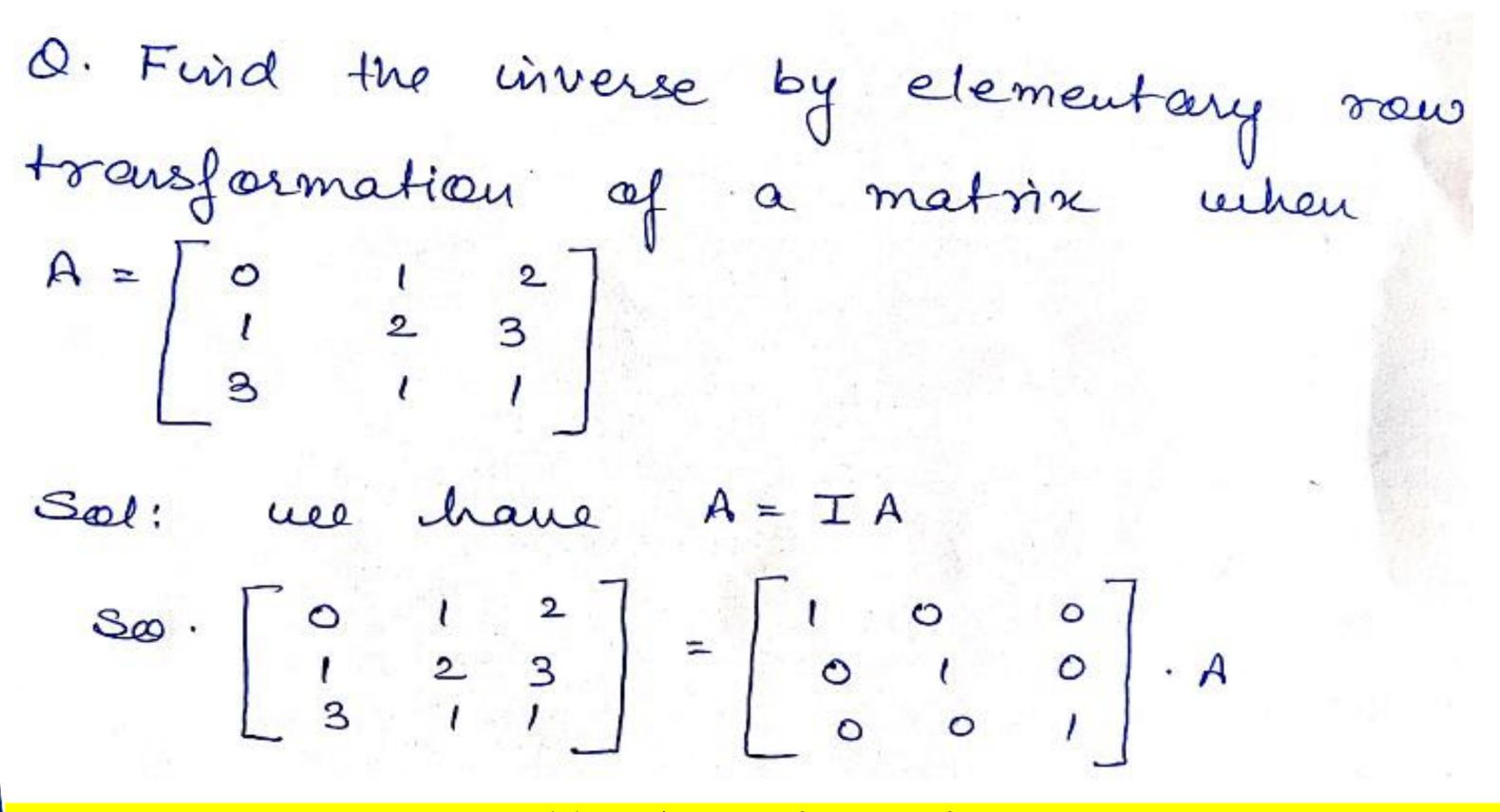
A set of mn numbers arranged in a rectangular array of m horizontal lines (rours) & n vertical lines (columns) is, known as matrix of order mxn. These numbers are called elements being enclosed in brackets [] or 11 11. In Compact form the matrix is represented as A=[aij]mxn where i = 1, 2, ..., m and j = 1, 2, ..., n. It is usually written as

(+, +)am a 211 a21 a31, a -3 amo . Im 4

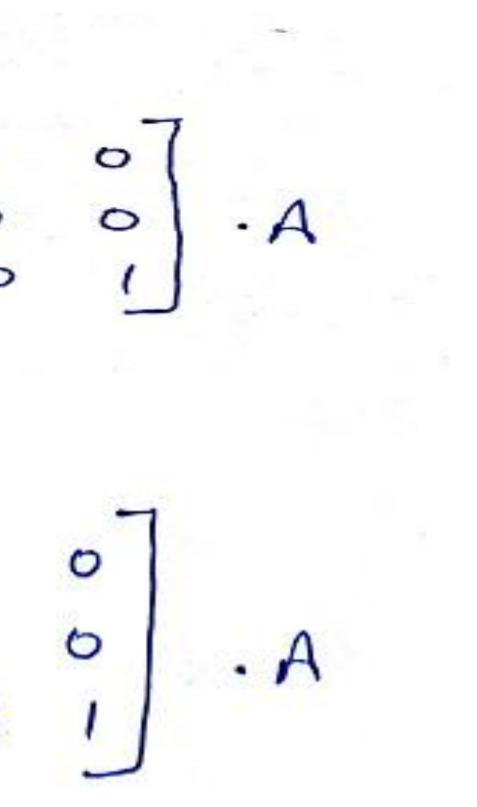


Inverse of a matrix Let A be a non singular matrix cof order n. If there exists another non singular matrix B of same order as A such that AB = BA = In they B

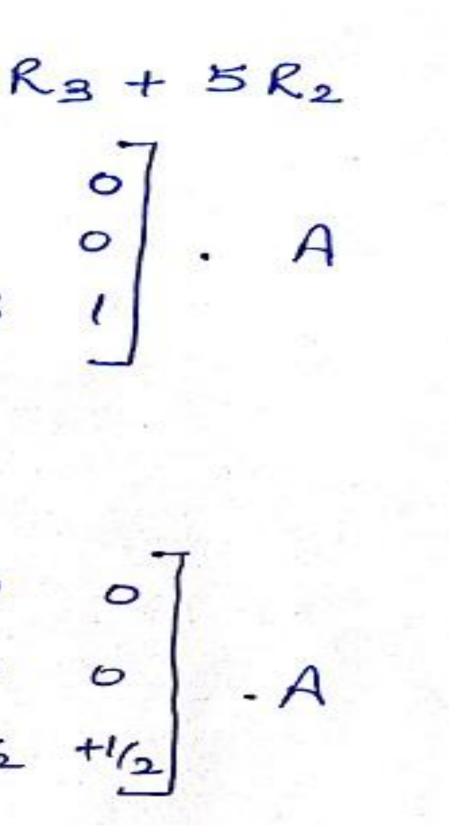
is called inverse of A and is denoted by A-1. Here In is an identity matrix of order n. we find the wiverse of a matrix by elementary transformation



RI E> R2 2 2 0 - 3 R1 Ra - 3 0 2 3 2

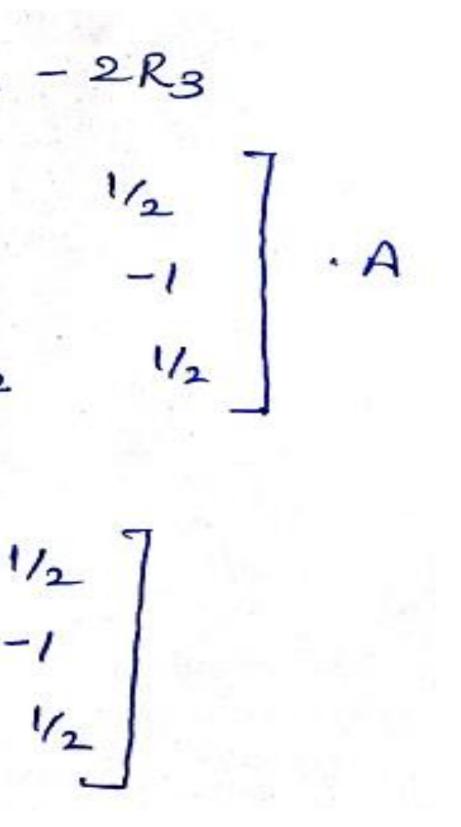


R1 -> R1 - 2R2 Ra 0 -1 1 2 0 2 0 .3 2 0



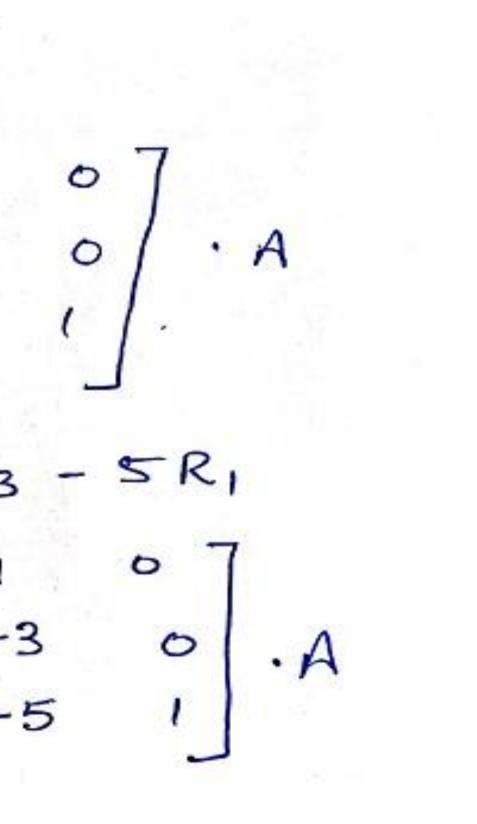
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R, > R, + R3 R2-> R2 6 5/2 1/2 2 -4

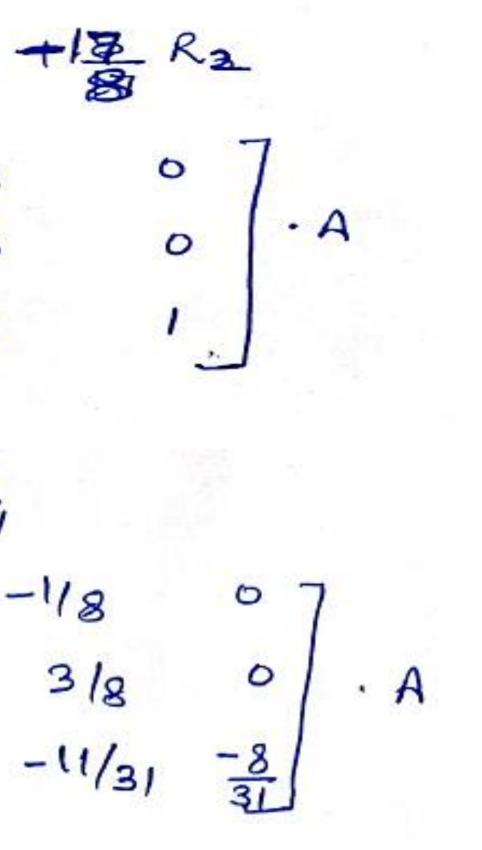


Q. Find the Inverse y élémentary matrix uhen by transformation of a  $A \ge \begin{bmatrix} 3 & 1 & 5 \\ 1 & 3 & 2 \\ 5 & -2 & 4 \end{bmatrix}$ Sel: have A=IA ue  $\begin{bmatrix} 3 & 1 & 5 \\ 1 & 3 & 2 \\ 5 & -2 & 4 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \cdot A$ 

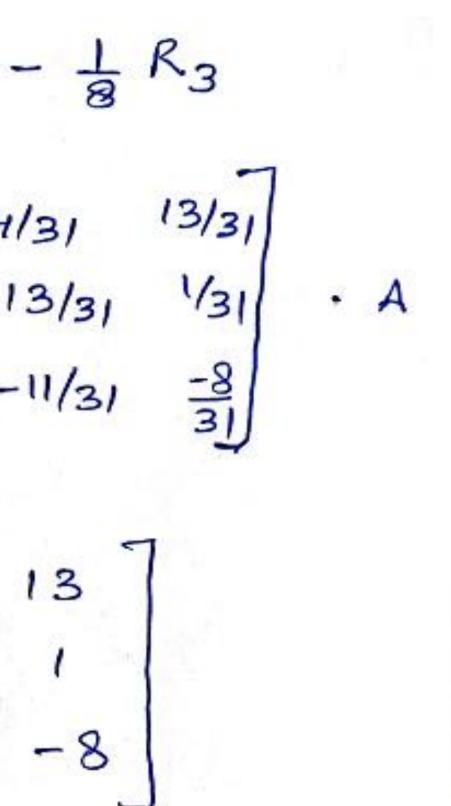
 $R_1 \leftrightarrow R_2$ 0 3 5  $\mathbf{O}$ R3-> R2 RI K2 K3 3 > C



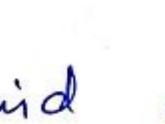
R3 R1 -> R1 + 3/8 R2 1/8 13 0 8 3 -17/8 11/8 D 0 3 3/8 13/8 0 -1/8 17/31 0 0

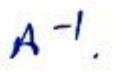


- R2  $R_1 \rightarrow R_1 - \frac{13}{8} R_3,$  $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix} = \begin{bmatrix} -16/31 & 14/31 \\ -6/31 & 13/31 \\ +17/31 & -11/31 \end{bmatrix}$ 13 -11



 $\mathbb{E}_{X_{1}}$ :  $\frac{4}{4} = \begin{bmatrix} 1 & 3 & 1 \\ 1 & 4 & 2 \\ -1 & -2 & 3 \end{bmatrix}$  find  $A^{-1}$ .  $E_{X.2.4}f A = \begin{bmatrix} -3 & 6 & -11 \\ 3 & -4 & 6 \\ 4 & -8 & 13 \end{bmatrix}$  find  $A^{-1}$ .  $\begin{array}{c} : (!) A^{-1} = \frac{1}{3} \begin{bmatrix} 16 & -11 & 2 \\ -5 & 4 & -1 \end{bmatrix} \begin{pmatrix} 2 \\ -1 \end{bmatrix} \begin{pmatrix} 2 \\ -1 \end{bmatrix} \begin{pmatrix} 2 \\ -1 \end{bmatrix} \begin{pmatrix} -4 \\ -1 \\ -1 \end{bmatrix} \begin{pmatrix} -8 \\ -1 \\ -8 \end{pmatrix} \begin{pmatrix} -8 \\ -8 \\ -8 \\ -8 \end{pmatrix} \begin{pmatrix} -8 \\ -8 \\ -8 \\ -8 \end{pmatrix} \begin{pmatrix} -8 \\ -8 \\ -8 \\ -8 \\ -8 \\ -8 \end{pmatrix}$ 





## Refrences

- 1.Advanced Engineering Mathematics by Prof.ERWIN KREYSZIG (Ch.10, page no. 557-580)
- 2. Advanced Engineering Mathematics by Prof.H.K Dass (Ch.14, page no.851-875)
- 3.Advanced Engineering Mathematics by B.V RAMANA (Ch.20, pageno. 20.1. 20.5)
- **4.NPTEL Lectures available on**

http://www.infocobuild.com/education/audio-video-courses/m athematics/TransformTechniquesForEngineers-IIT-Madras/lecture-47.html



### **JECRC Foundation**



