SECTION: 11

Course Name:MAT125(Quiz01- Fall 2020)

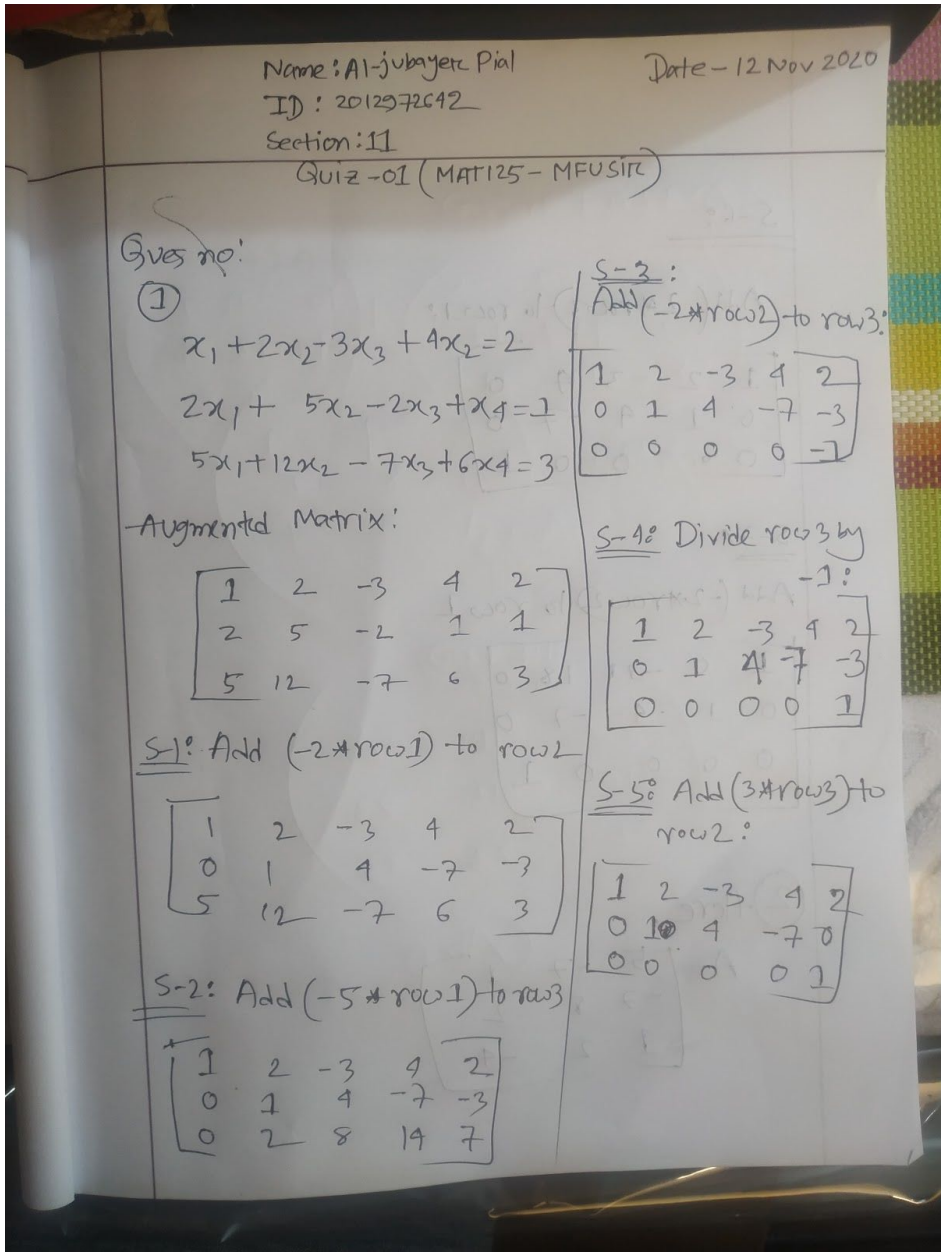
Submitted to:

Dr. Mohammed Forhad Uddin

Department of Mathematics & Physics

Submitted by:

Al-Jubayer Pial



Name: Al-jubayer Pial
ID: 2012972642
Section: 11
Date – 12 Nov 2020

Quiz-01 (MAT125 – MFUSIC)

Ques no:

(1)

$$x_1 + 2x_2 - 3x_3 + 4x_2 = 2$$
$$2x_1 + 5x_2 - 2x_3 + x_4 = 1$$
$$5x_1 + 12x_2 - 7x_3 + 6x_4 = 3$$

Augmented Matrix:

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 2 & 5 & -2 & 1 & 1 \\ 5 & 12 & -7 & 6 & 3 \end{bmatrix}$$

S-1: Add (-2*row1) to row2

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & 4 & -7 & -3 \\ 5 & 12 & -7 & 6 & 3 \end{bmatrix}$$

S-2: Add (-5*row1) to row3

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & 4 & -7 & -3 \\ 0 & 2 & 8 & 14 & 7 \end{bmatrix}$$

S-3: Add (-2*row2) to row3:

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & 4 & -7 & -3 \\ 0 & 0 & 0 & 0 & -1 \end{bmatrix}$$

S-4: Divide row3 by -1:

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & 4 & -7 & -3 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

S-5: Add (3*row3) to row2:

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & 4 & -7 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

ID:2012972642

S-6:

Add (-2*row3) to row1:

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 0 \\ 0 & 1 & 4 & -7 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

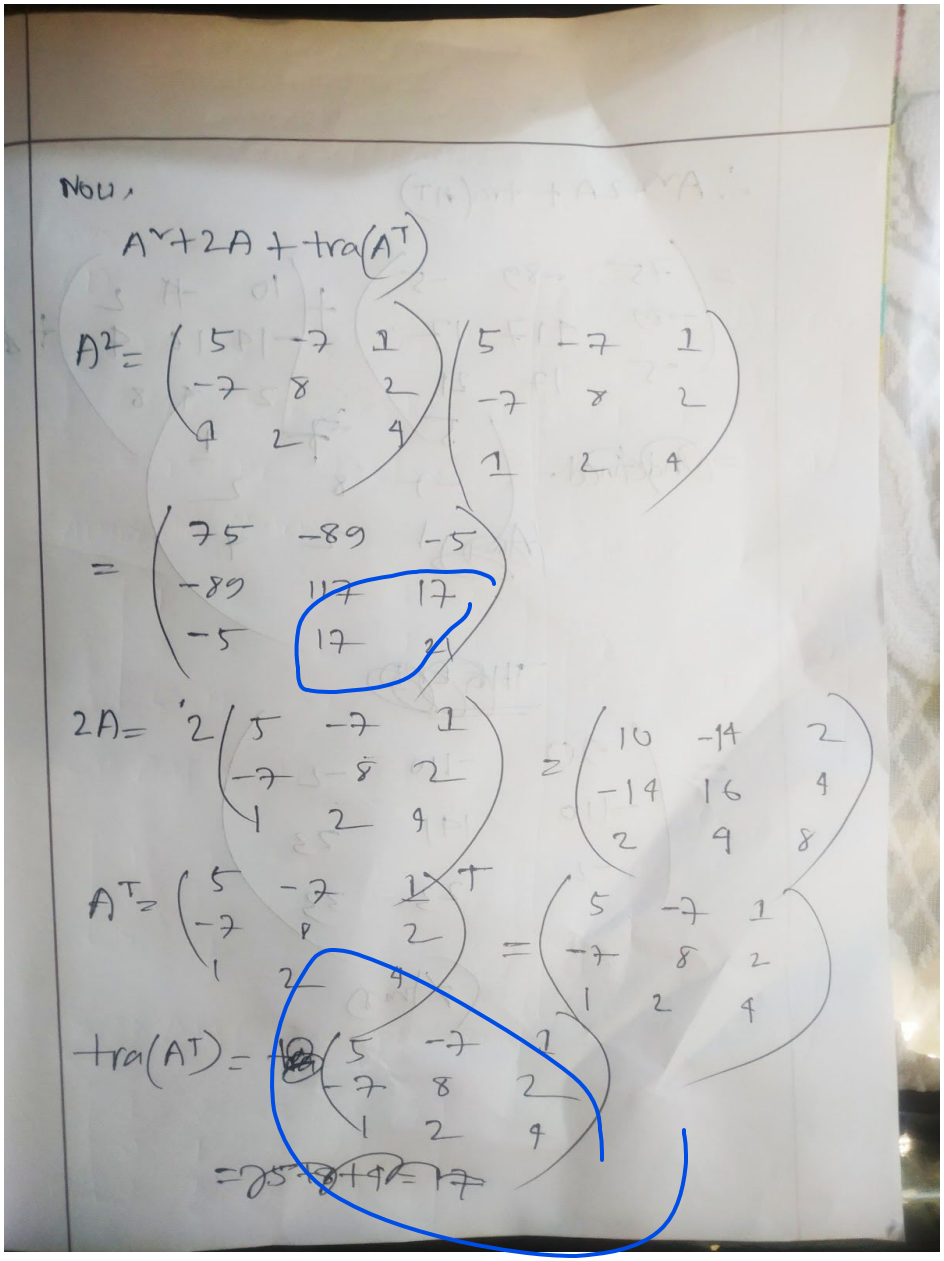
S-7:

Add (-2*row2) to row1

$$\begin{bmatrix} 1 & 0 & -11 & 18 & 0 \\ 0 & 1 & 4 & -7 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

(2) Here,

$$A = \begin{bmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & -4 \end{bmatrix}$$


Now,
$A^2+2A+tra(A^T)$
$A^2=\begin{pmatrix}5&-7&1\\-7&8&2\\1&2&4\end{pmatrix}\begin{pmatrix}5&-7&1\\-7&8&2\\1&2&4\end{pmatrix}$
$=\begin{pmatrix}75&-89&-5\\-89&117&17\\-5&17&21\end{pmatrix}$
$2A=2\begin{pmatrix}5&-7&1\\-7&8&2\\1&2&4\end{pmatrix}=\begin{pmatrix}10&-14&2\\-14&16&4\\2&4&8\end{pmatrix}$
$A^T=\begin{pmatrix}5&-7&1\\-7&8&2\\1&2&4\end{pmatrix}^T=\begin{pmatrix}5&-7&1\\-7&8&2\\1&2&4\end{pmatrix}$
$tra(A^T)=\begin{pmatrix}5&-7&1\\-7&8&2\\1&2&4\end{pmatrix}$

$\therefore A^2 + 2A + \text{tra}(AT)$

$$= \begin{pmatrix} 75 & -89 & -5 \\ -89 & 107 & 17 \\ -5 & 17 & 21 \end{pmatrix} + \begin{pmatrix} 10 & -11 & 2 \\ -14 & 16 & 4 \\ 2 & 4 & 8 \end{pmatrix} + \begin{pmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & 4 \end{pmatrix}$$

= ~~Undefined~~.

(Ans)

~~THE END~~

$$= \begin{pmatrix} 90 & -110 & -2 \\ -110 & 141 & 23 \\ -2 & 23 & 33 \end{pmatrix}$$

(Ans)