Fazle Rabbi
183121104 2

Ans to the Q No. 2

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

(i) No. 2

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

$$= \begin{bmatrix} 75 & -89 & -13 \\ -89 & 117 & 1 \\ -13 & 1 & 21 \end{bmatrix}$$

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

$$= \begin{bmatrix} 10 & -14 & 2 \\ -14 & 16 & 4 \\ 2 & 4 & -8 \end{bmatrix}$$

$$\text{tra}(A^T) = \begin{bmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & -4 \end{bmatrix}$$

$$\therefore \quad A^2 + 2A + \text{trace}(A^T)$$

$$= \begin{bmatrix} 75 & -89 & -13 \\ -89 & 117 & 1 \\ -13 & 1 & 2 \end{bmatrix} + \begin{bmatrix} 10 & -14 & 2 \\ -14 & 16 & 4 \\ 2 & 4 & -8 \end{bmatrix} + \begin{bmatrix} 5 & -7 & 1 \\ -7 & 8 & 2 \\ 1 & 2 & -4 \end{bmatrix}$$

$$= \begin{bmatrix} 90 & -110 & -10 \\ -110 & 141 & 7 \\ -10 & 7 & -10 \end{bmatrix}$$

Ans to the Q NO. 1

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

Multiply 2 to the first row and change subtract from 2nd row to 2nd row

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & -8 & -7 & -3 \\ 5 & 12 & -7 & 6 & 3 \end{bmatrix}$$

Now, multiply 5 to the first row and subtract from third row in order to change third row.

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & -8 & -7 & -3 \\ 0 & 2 & -22 & -14 & -7 \end{bmatrix}$$

$$r_3' = r_3 - 2r_2$$

$$\begin{bmatrix} 1 & 2 & -3 & 4 & 2 \\ 0 & 1 & -8 & -7 & -3 \\ 0 & 0 & 6 & 0 & -1 \end{bmatrix}$$

$$r_1' = r_1 - 2r_2$$

$$\begin{bmatrix} 1 & 0 & 13 & 18 & 8 \\ 0 & 1 & -8 & -7 & -3 \\ 0 & 0 & 6 & 0 & -1 \end{bmatrix}$$

$$r_3' = \frac{1}{6} \times 6$$

$$\begin{bmatrix} 1 & 0 & 13 & 18 & 8 \\ 0 & 1 & -8 & -7 & -3 \\ 0 & 0 & 1 & 0 & -1 \end{bmatrix}$$

$R_2' = R_2 + 8R_3$

$R_1' = R_1 - 13R_3$

$$\begin{bmatrix} 1 & 0 & 0 & 18 & 8 \\ 0 & 1 & 0 & -7 & -3 \\ 0 & 0 & 1 & 0 & -1 \end{bmatrix}$$