

Some questions in subject of **Matrices**

Q₁/ If B is nilpotent matrix show that (D=I-B) is idempotent matrix all so.

Q₂/ Let $A = \begin{bmatrix} 5 & 4 \\ -3 & 6 \end{bmatrix}$ Show that:

- 1- $(A - A')$ is skew symmetric.
- 2- $(A + A')$ is symmetric.
- 3- Find A^2

Q₃/ Find the value of (x and y) if: $\begin{bmatrix} x+3y \\ 2-y \end{bmatrix} + \begin{bmatrix} x-5 \\ 3x+2y \end{bmatrix} = \begin{bmatrix} 5 \\ 3 \end{bmatrix}$

Q₄/ If $C_{ij} = 3i - 2j$ find matrix C for size (3×3) then find:

- 1- The trace of matrix C.
- 2- C'

Q₅/ Let $A = \begin{bmatrix} 2 & 3 \\ -1 & 4 \end{bmatrix}$ Show that:

- 1- $(A' - A)$ is skew symmetric.
- 2- $(A + A')$ is symmetric.
- 3- Find A^3

Q₆/ If B is symmetric , C is skew symmetric and $AB=BA$ show AB is skew symmetric.

Q₇/ If $C_{ij} = 3i^3 - j$ find matrix C for size (2×3) then find:

- 1- The trace of matrix C.
- 2- C'

Q₈/ Find the value of (x and y) if: $\begin{bmatrix} x & 1 \\ y & 2 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ 3y \end{bmatrix} = \begin{bmatrix} -4 \\ 9 \end{bmatrix}$

Q₉/ Let $A = \begin{bmatrix} 2 & a \\ 4 & b \end{bmatrix}$ and $B = \begin{bmatrix} 4 & d \\ -1 & -2 \end{bmatrix}$, if $AB=I$ find all:

- 1- All missing value in matrix A and B.
- 2- The trace of matrix AB.
- 3) Show that $(A.B)' = B'.A'$.

Q₁₀/ If $AB = BA$ show that $(A - B)(A + B) = A^2 - B^2$.

Q₁₁/ Find the value of x and y If $\begin{bmatrix} 2x-y \\ 3-2y \end{bmatrix} - \begin{bmatrix} 5x+6 \\ 2y-3x \end{bmatrix} = \begin{bmatrix} -3 \\ 4 \end{bmatrix}$

Q₁₂/ If $G = \begin{bmatrix} 0 & 3+i \\ -3+i & -5i \end{bmatrix}$ and $\alpha = 2$ find all:

- 1- αA .
- 2- Is αA . Hermitian or Skew Hermitian matrix.

Q₁₃/ a) If $c_{ij} = 2i - 3j^2$, Find all:

- 1) The matrix of C for size (2×2).
- 2) Trace of matrix C.

b) If $A.B=B.A$ show that $(A+B)^2 = A^2 + 2AB + B^2$

Q14/ If $G = \begin{bmatrix} a & 4 \\ b & 2 \end{bmatrix}$, $H = \begin{bmatrix} 1 & -2 \\ 1 & d \end{bmatrix}$ and $GH=HG=I$ Find:

- 1) All elements of (a, b, d).
- 2) $|G| = |G'|$
- 3) $\text{tr}(GH)$.

Q15/ If $F = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ find all:

1-

F^2

2- What is the type of (F).

Q16/ If $B = \begin{bmatrix} -1 & 2 & 3 \\ 1 & -1 & 0 \\ 3 & 2 & -2 \end{bmatrix}$ find B^{-1} by using adjoint method.

Q17/ Find the value of x and y if $\begin{bmatrix} x+2y \\ 3x+y \end{bmatrix} + \begin{bmatrix} 3x-4y \\ -x+y \end{bmatrix} = \begin{bmatrix} 6 \\ -3 \end{bmatrix}$

Q18/ Find the determinant of A by using Laplace method.

$$\text{If } A = \begin{bmatrix} 2 & -1 & 1 \\ 3 & 2 & 4 \\ -1 & 0 & 3 \end{bmatrix}$$

تعیینی // به هه‌لبژاردنی پیزی ئاسۆیی یه‌که‌م و دووهم بۆ لادان
(بأختیار الصف الاول والثاني للحذف)

Q19/ If $B = \begin{bmatrix} 2 & 1 & -3 \\ 0 & -3 & 2 \\ -1 & 4 & -2 \end{bmatrix}$ find B^{-1} by using adjoint method.

Q20/ If A is symmetric matrix, B is skew symmetric matrix and $A.B=B.A$ show that (AB) is skew symmetric matrix

Q21/ If $A^{-1} = \begin{bmatrix} \frac{1}{2} & 1 \\ -\frac{3}{2} & -2 \end{bmatrix}$ if $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $A^{-1}A=AA^{-1}=I$ Find:

- 1) All elements of matrix A.
- 2) $\text{adj}(A') = [\text{adj}(A)]'$
- 3) $\text{adj}(A^{-1}) = [\text{adj}(A)]^{-1}$

Q22/ If $J = \begin{bmatrix} 3+2i & 1-3i \\ 2 & -3+2i \end{bmatrix}$ **and** $K = \begin{bmatrix} 4i & -3i \\ 4+i & 1-4i \end{bmatrix}$ **show that** $(JK)' = J'.K'$

Q23/ If $c_{ij} = i^2 - 3j$, **Find all:**

1) **The matrix of C for size (2×2).** 2) **Trace of matrix C.**

3) **Show that** $|C^2| = |C|.|C|$

Q24/ Find the determinant of G by using Laplace method.

$$\text{If } G = \begin{bmatrix} 2 & -1 & 3 & 4 \\ 1 & -2 & 0 & 3 \\ 1 & -3 & 3 & 1 \\ -2 & 3 & 1 & 0 \end{bmatrix}$$

تیبینی // به ههلبژاردنی ریزی ناسۆیی یه کهم و دووهم بۆ لادان
(بأختيار الصف الاول والثاني للحذف)

.....