**MATH**

**PAGEMAKER10**

**Matrix**

Q1. If A in a matrix of order 3 and |A|=8, then |ajA| is

(a) 1

(b) 2

(c) 23

(d) 26

L1Difficulty1

Qtag Mathematics

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Q2. If A = then A2 is

(a)

(b)

(c)

(d)

L1Difficulty1

Qtag Mathematics

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Q3. The rank of the matrix is

(a) 1 if a = 6

(b) 2 if a = 1

(c) 3 if a = 2

(d) –1 if a = +6

L1Difficulty1

Qtag Mathematics

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Q4. If A = and I is a unit matrix of 3rd order then (A2 + aI) is

(a) 2A

(b) 4A

(c) 6A

(d) none

L1Difficulty1

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Q5. If A = then AA' is

(a)

(b)

(c)

(d) none

L1Difficulty1

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Q6. If A = and I is the identy matrix of order2 then (A – 2I)(A – 3I) is

(a) I

(b) 0

(c)

(d)

L1Difficulty1

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Q7. If A, B, C are three square matrix such that AB = AC implies B = C, then the matrix A is always a/an

(a) singular matrix

(b) non-singular matrix

(c) orthogonal matrix

(d) diagonal matrix

L1Difficulty1

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Q8. If A is square matrix A + AT is symmetric matrix then A – AT =

(a) unit matrix

(b) symmetric matrix

(c) skew symmetric matrix

(d) zero matrix

L1Difficulty1

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Q9. The matrix A =

(a) Unitary

(b) Orthogonal

(c) Nilpotent

(d) Involuntary

L1Difficulty1

Qtag Mathematics

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Q10. If matrix A = and A–1 = adjA then k is

(a) 7

(b) –7

(c)

(d) 11

L1Difficulty1

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**Solutions**

S1. Ans. (d)

Sol.

jA

=

S2. Ans. (c)

Sol.

A2 =

=

S3. Ans. (b)

Sol.

A =

=

a = 1 p(A) = 2

S4. Ans. (d)

Sol.

A =

A2 =

I =

A2 + =

S5. Ans. (c)

Sol.

A’ =

therefore AA’ =

=

S6. Ans. (b)

Sol.

(A – 2I) (A – 3I)

 = = 0

S7. Ans. (b)

Sol.

AB = AC B = C

if A–1 exists A is non singular

S8. Ans. (c)

Sol.

It is properly that if A is a square matrix, then A + AT, AAT, ATA are symmetric matrixes while A – AT is skew – symmetric matrix

S9. Ans. (c)

Sol.

A2 = AA

= = 0

S10. Ans. (d)

Sol.

k = |A|

|A| = = 11

**LEVEL-II**

Q1. Let and then the value of and are

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

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Q2. The element of second row and third column in the inverse of is

(a)

(b)

(c) 1

(d) 2

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q3. If , then

(a)

(b)

(c)

(d) None of these

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q4. If and be symmetric matrices of the same order, then will be a

(a) Symmetric matrix

(b) Skew symmetric matrix

(c) Null matrix

(d) None of these

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q5. If is a square matrix, its transpose, then is

(a) A symmetric matrix

(b) A skew symmetric

(c) A unit matrix

(d) An elementary matrix

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q6. The adjoint of the matrix is

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q7. If is a squarer matrix, then which of the following matrices is not symmetric

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q8. If and then is equal to

(a) 0

(b) 1

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q9. If a matrix is such that then its inverse is

(a)

(b)

(c)

(d) None of these

L3Difficulty3

Qtag Mathematics

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Q10. If and are square matrices of the same order, then

(a)

(b)

(c) If or

(d) If or

L3Difficulty3

Qtag Mathematics

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**Solutions**

S1. Ans. (a)

Sol.

Given,

S2. Ans. (b)

Sol.

In the element of 2nd row and 3rd column is the element of the matrix of cofactors of element of (due to transposition) divided by

Required element =

where = minor of in

S3. Ans. (c)

Sol.

S4. Ans. (b)

Sol.

Since are symmetric and

 d

 is skew-symmetric.

S5. Ans. (b)

Sol.

Taking

Since

=

 is a skew symmetric matrix.

S6. Ans. (a)

Sol.

Let

.

S7. Ans. (d)

Sol.

Since so it is symmetric

 so it is symmetric.

 so it is symmetric.

But Hence it is not symmetric.

S8. Ans. (b)

Sol.

Let

The matrix of cofactors of the elements of

=

 the transpose of matrix of cofactors of

=

 = (as given)

**Aliter :**

Hence

S9. Ans. (a)

Sol.

S10. Ans. (b)

Sol.

It is obvious.

**LEVEL-III**

Q1. Which of the following

(i) Adjoint of a symmetric matrix is symmetric,

(ii) Adjoint of a unit matrix is a unit matrix,

(iii) and

(iv) Adjoint of a diagonal matrix is a diagonal matrix, is/are incorrect

(a) (i)

(b) (ii)

(c) (iii) and iv)

(d) None of these

L5Difficulty5

Qtag Mathematics

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Q2. The matrix is which of the following

(a) Symmetric

(b) Skew-symmetric

(c) Hermitian

(d) Skew-hermitian

L5Difficulty5

Qtag Mathematics

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Q3. If then

(a)

(b)

(c)

(d) None of these

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q4. Which one of the following is correct

(a) Skew-symmetric matrix of odd order is non-singular

(b) Skew-symmetric matrix of odd order is singular

(c) Skew-symmetric matrix of even order is always singular

(d) None of these

L5Difficulty5

Qtag Mathematics

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Q5.

where then pair of values

(a)

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q6. If then is equal to

(a)

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q7. The matrix is not invertible, if has the value

(a) 2

(b) 1

(c) 0

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q8. If matrix and then is

(a) 7

(b)

(c)

(d) 11

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q9. If is a square matrix for which then is

(a) Zero matrix

(b) Unit matrix

(c) Symmetric matrix

(d) Skew symmetric matrix

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q10. If then

(a)

(b)

(c)

(d) None of these

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

**Solutions**

S1. Ans. (d)

Sol.

All the given statements are true.

S2. Ans. (d)

Sol.

Since for

Thus, is skew hermitian.

S3. Ans. (c)

Sol.

S4. Ans. (b)

Sol.

It is a concept.

S5. Ans. (c)

Sol.

Given

By

 [By equality of matrices]

 satisfy the relation.

S6. Ans. (a)

Sol.

.

S7. Ans. (b)

Sol.

The matrix is not invertible if

S8. Ans. (d)

Sol.

S9. Ans. (d)

Sol.

is a square matrix. For a skew symmetric matrix

 and

.

Hence, is a skew symmetric matrix.

S10. Ans. (a)

Sol.

It is obvious.