



Virtual University

About Us

MTH501  
Solved Final Term Paper 4

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Year  
2017

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the Name of Allāh, the Most Gracious, the Most Merciful

### Paper Pattern

MCQS 40 each 1 mark  
Short 4 each 2 marks  
Short 4 each 3 marks  
long 4 each 5 marks

Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

$\|u + v + w\| \leq \|u\| + \|v\| + \|w\|$  for all vectors  $u, v$  and  $w$  in an inner product space.

Answer ( Please select your correct option )

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True

☒

**correct**

False

☐

**Made by: Waqar Siddhu**

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

The dominant eigenvalue for the matrix  $A = \begin{bmatrix} 0 & 0 & 2 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & -3 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$  is

Answer ( Please select your correct option )

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$\lambda = 1$

☐

$\lambda = -3$

☒

**correct**

$\lambda = -1$

☐

$\lambda = 0$

☐

**Made by: Waqar Siddhu**

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

A square matrix A is invertible if and only if  $x = 0$  is not an eigen value of A.

Answer ( Please select your correct option )

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True

☒

correct

False

☐

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Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

A square matrix with orthogonal columns \_\_\_\_\_ matrix. (Click on most appropriate)

Answer ( Please select your correct option )

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is an orthogonal

☒

correct

may be an orthogonal

☐

may not be an orthogonal

☐

is not an orthogonal

☐

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Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

If two rows are orthogonal, they are \_\_\_\_\_.

Answer ( Please select your correct option )

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linearly independent

☒

correct

linearly dependent

☐

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Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

If  $x$  is orthogonal to both  $u$  and  $v$ , then  $x$  must be \_\_\_\_\_ to  $u + v$ .

not sure

Answer ( Please select your correct option )

[WWW.VirtualAcademyLive.com](http://WWW.VirtualAcademyLive.com)☐ orthogonal☐ orthonormal

correct

☐ perpendicular☐ parallel

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Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

The given system  $\begin{matrix} 2x + 3y = 3 \\ 6x + 9y = 7 \end{matrix}$  has

Answer ( Please select your correct option )

[WWW.VirtualAcademyLive.com](http://WWW.VirtualAcademyLive.com)☐ Unique solution☐ Infinitely many solutions☐ No solution

correct

☐ None of these

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Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

Which statement about the matrix  $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 7 & 2 & 0 & 0 \\ 9 & 1 & 2 & 0 \\ 5 & 4 & 2 & -1 \end{bmatrix}$  is false?

Answer ( Please select your correct option )

[WWW.VirtualAcademyLive.com](http://WWW.VirtualAcademyLive.com)☐ Eigenvalue 2 has Algebraic multiplicity 1☐ Eigenvalue of the matrix are 1, 2 and -1.☐ Characteristic polynomial of the matrix is  $(1 - \lambda)(2 - \lambda)^2(-1 - \lambda)$ .☐ Eigenvalue -1 has multiplicity 1.

**Made by: Waqar Siddhu**



Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

If  $A = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}$  is diagonalizable then A has 2 distinct eigenvalues.

Answer ( Please select your correct option )

[WWW.VirtualAcademyLive.com](http://WWW.VirtualAcademyLive.com)☐ True☐☐ False☐**Made by: Waqar Siddhu**

Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

A is diagonalizable if  $A = PDP^{-1}$  Where

Answer ( Please select your correct option )

[WWW.VirtualAcademyLive.com](http://WWW.VirtualAcademyLive.com)☐ D is any matrix and P is an invertible matrix☐☐ D is a diagonal matrix and P is any matrix☐☐ D is a diagonal matrix and P is invertible matrix☐**correct**☐ D is a invertible matrix and P is any matrix☐**Made by: Waqar Siddhu**

Question No : 22 of 52

Marks: 1 (Budgeted Time 1 Min)

Which statement is FALSE.

Answer ( Please select your correct option )

[WWW.VirtualAcademyLive.com](http://WWW.VirtualAcademyLive.com)☐ If  $Ax = \lambda x$  for some real number  $\lambda$  then  $\lambda$  is known as eigenvalue of the matrix A.☐☐ The eigenvalues of any matrix are on its main diagonal.☐☐ In order to find the eigenvalues we solve the equation  $|A - \lambda I| = 0$ ☐☐ An eigenspaces of A is the Null space of some matrix.☐**correct****Made by: Waqar Siddhu**



Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)

How many terms are there in the algebraic expression  $8x^2 + \sqrt{9x} \times 25x^3$ ?

Answer ( Please select your correct option )

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☐ 4☐ 3☒ 2correct☐ 1

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Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

If two matrices are added, then which of the following should be true for them?

Answer ( Please select your correct option )

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☐ Both must have same order.correct☐ Both must have different order.☐ Both must be rectangular.☐ Both must be square.

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Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

If a matrix  $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 6 & 1 & 1 \end{bmatrix}$ , then which of the following is true for  $A$ ?

Answer ( Please select your correct option )

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☐ It is a rectangular matrix.☐ It is a row matrix.☒ It is a singular matrix.correct☐ It is a scalar matrix.

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Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

If  $\vec{v}_1, \vec{v}_2$  and  $\vec{v}_3$  are in  $R^m$  then which of the following is equivalent to  $[\vec{v}_1 \ \vec{v}_2 \ \vec{v}_3] \begin{bmatrix} 2 \\ -7 \\ 5 \end{bmatrix}$ ?

Answer ( Please select your correct option )

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☐

$2\vec{v}_1 - 7\vec{v}_2 + 5\vec{v}_3$

**correct**☐

$5\vec{v}_1 - 7\vec{v}_2 + 2\vec{v}_3$

☐

$5\vec{v}_1 + 2\vec{v}_2 - 7\vec{v}_3$

☐

$2\vec{v}_1 + 5\vec{v}_2 - 7\vec{v}_3$

**Made by: Waqar Siddhu**

Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

If  $(\vec{v}_1, \vec{v}_2, \vec{v}_3)$  is linearly dependent set and  $\vec{v}_1 \neq c\vec{v}_2$  (where 'c' is a scalar), then which option is true?

Answer ( Please select your correct option )

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☐

$\vec{v}_1 \in \text{Span}(\vec{v}_1, \vec{v}_2)$

☐

$\vec{v}_2 \in \text{Span}(\vec{v}_1, \vec{v}_2)$

☐

$\vec{v}_3 \in \text{Span}(\vec{v}_1, \vec{v}_2)$

☐

$\vec{v}_3 \notin \text{Span}(\vec{v}_1, \vec{v}_2)$

**Made by: Waqar Siddhu**

Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

If  $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 0 & 1 \\ 0 & -1 & 1 \end{bmatrix}$ , then which of the following is true for the matrix A?

Answer ( Please select your correct option )

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☐

It is an invertible matrix.

☐

It is a singular matrix.

☐

It is a non-invertible matrix.

**correct**☐

It is a rectangular matrix.

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