VIRTUAL UNIVERSITY OF PAKISTAN

A Good Education is a Foundation For a Better Future

CORRECT ANSWER SOLVED BY HADI
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(Final Term Past Paper)

MADE AND SOLVED BY TEAM HADI

WARNING: Team HADI is not responsible for any mistake or wrong answer. All students reading and using this document may check and confirm the answers at their own.

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Best of luck!

PAST PAPER

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.

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Answer (Please select your correct option)

- True

correct

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- False

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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

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Answer (Please select your correct option)

- $\lambda = 1$
- $\lambda = -3$ correct
- $\lambda = -1$
- $\lambda = 0$

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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.

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Answer (Please select your correct option)

- True

correct

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- 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)

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Answer (Please select your correct option)

- 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)

- linearly independent

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- 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

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Answer (Please select your correct option)

- orthogonal
- orthonormal

correct

- perpendicular
- parallel

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Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

The given system $2x + 3y = 3$, $6x + 9y = 7$ has

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Answer (Please select your correct option)

- Unique solution
- Infinitely many solutions
- No solution
- 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?

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Answer (Please select your correct option)

- 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.

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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.

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Answer (Please select your correct option)

- True
- False

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check it

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Question No : 21 of 52 Marks: 1 (Budgeted Time 1 Min)

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

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Answer (Please select your correct option)

- 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

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Question No : 22 of 52 Marks: 1 (Budgeted Time 1 Min)

Which statement is FALSE.

Answer (Please select your correct option)

- If $Ax = \lambda x$ for some real number λ then λ is known as eigenvalue of t he matrix A.
- The eigenvalues of any matrix are on its main diagonal.
- In order to find the eigenvalues we solve the equation $|A - \lambda| = 0$
- An eigenspaces of A is the Null space of some matrix.

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Question No : 23 of 52 Marks: 1 (Budgeted Time 1 Min)

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

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Answer (Please select your correct option)

- 4
- 3
- 2 corrcet
- 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?

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Answer (Please select your correct option)

- 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?

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Answer (Please select your correct option)

- It is a rectangular matrix.
- It is a row matrix.
- It is a singular matrix.
- It is a scalar matrix.

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correct

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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 $[v_1 \quad v_2 \quad v_3]\begin{bmatrix} 2 \\ -7 \\ 5 \end{bmatrix}$?

Answer (Please select your correct option)

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

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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 ?

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Answer (Please select your correct option)

- It is an invertible matrix.
- It is a singular matrix.
- It is a non-invertible matrix.
- It is a rectangular matrix.

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correct

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Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)

Which statement about the General Least Square Method is true?

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Answer (Please select your correct option)

- Solution obtained by this method is always unique.
- This is a numerical method for the solution of System of Linear Equations.
- This method find an x that makes Ax as close as possible to the b.
- This method gives us exact solution of the system.

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Question No : 7 of 52 Marks: 1 (Budgeted Time 1 Min)

Suppose that $A = \begin{bmatrix} 1.25 & -.75 \\ -.75 & 1.25 \end{bmatrix}$ has eigenvalues 2 and 0.5 .Then origin is a

origin 'O' is called the saddle point because one eigenvalue is greater tha in magnitude and one is less than '1' in magnitude.

Answer (Please select your correct option)

- Saddle point — **correct**
- Repellor
- Attractor

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Question No : 8 of 52 Marks: 1 (Budgeted Time 1 Min)

Suppose that $A = \begin{bmatrix} 0.5 & 0.6 \\ -0.3 & 1.4 \end{bmatrix}$ has eigenvalues 0.8 and 1.1 .Then origin is a

Answer (Please select your correct option)

- Saddle point

  correct

- Repellor

- Attractor

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Question No : 10 of 52 Marks: 1 (Budgeted Time 1 Min)

The matrix equation $A^T A\hat{x} = A^T b$ represents a system of linear equations commonly referred to as the

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Answer (Please select your correct option)

- normal equations for x
- normal equations for $\hat{x}$ correct
- normal equations for A
- normal equations for b

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Question No : 11 of 52 Marks: 1 (Budgeted Time 1 Min)

By the Best Approximation Theorem, the distance from y to W is $\|y - \hat{y}\|$, where $\hat{y} =$

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Answer (Please select your correct option)

- $\text{proj}_W \hat{y}$
- $\text{proj}_W y$ **correct**
- $\text{proj}_y w$

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