6406532306465. ✖ Range(X) will always increase with the increase in the number of observations of X.

Maths2

Section Id :	64065348502
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	9
Number of Questions to be attempted :	9
Section Marks :	25
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653100808
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 50 Question Id : 640653689450 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "FOUNDATION LEVEL : MATHEMATICS FOR DATA SCIENCE II (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?

CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406532306466. ✔ YES

6406532306467. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	640653100809
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 51 Question Id : 640653689459 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following functions are linear transformations?

Options :

6406532306486. ✖ $T : \mathbb{R} \to \mathbb{R}, T(x) = 2x + 1$

6406532306487. ✔ $T : \mathbb{R}^4 \to \mathbb{R}^2, T(x, y, z, w) = (x + y, z + w)$

6406532306488. ✔ $T : \mathbb{R}^3 \to \mathbb{R}^3, T(x, y, z) = (-y, -x, 0)$

6406532306489. ✖ $T : \mathbb{R} \to \mathbb{R}^2, T(x) = (x + 1, x - 1)$

Question Number : 52 Question Id : 640653689460 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let T be a linear transformation from $\mathbb{R}^2$ to $\mathbb{R}^3$. $S \subset \mathbb{R}^2$ is a line passing through the origin. Which of the following are possible?

Options :

6406532306490. ✔ $T(S)$ could be the origin in $\mathbb{R}^3$.

6406532306491. ✔ $T(S)$ could be a line passing through the origin in $\mathbb{R}^3$.

6406532306492. ✖ $T(S)$ could be a plane passing through the origin in $\mathbb{R}^3$.

6406532306493. ✖ $T(S)$ could be $\mathbb{R}^3$

Sub-Section Number :	3
Sub-Section Id :	640653100810
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 53 Question Id : 640653689451 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let A and B be $n \times n$ matrices. Which of the following statement(s) is/are true?

Options :

6406532306468. ✔ If A and B are similar, then nullity of A and nullity of B are equal.

6406532306469. ✔ Let A and B be similar matrices. Then the homogeneous system of linear equations $Ax = 0$ has a unique solution if and only if the homogeneous system of linear equations $Bx = 0$ has a unique solution.

6406532306470. ✖ If A^k and B^k are similar for some positive integer k, then A and B are similar.

6406532306471. ✔ If A and B are similar matrices where A is a scalar matrix, then $A = B$.

Question Number : 54 Question Id : 640653689458 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let *A* be a *n* × *n* orthogonal matrix. Then which of the following statement(s) is/are true?

Options :

6406532306482. ✔ The rows of A form an orthonormal basis for $\mathbb{R}^n$.

6406532306483. ✔ Suppose T is the linear transformation corresponding to A, then $\|Tv\| = \|v\|$ for any $v \in \mathbb{R}^n$.

6406532306484. ✔ The system of linear equations $Ax = b$ has a unique solution for every $b \in \mathbb{R}^n$.

6406532306485. ✖ The rows of A form an orthogonal basis but not an orthonormal basis for $\mathbb{R}^n$.

Sub-Section Number : 4

Sub-Section Id : 640653100811

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653689452 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (55 to 56)

Question Label : Comprehension

Let $L = \{(x, y) : y = x + 1\}$ and $L' = \{(x, x + z - 2, z) : x, z \in \mathbb{R}\}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 55 Question Id : 640653689453 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct option from the following.

Options :

6406532306472. ✖ The subspace associated with the affine space L is the line $y = x + 1$.

6406532306473. ✔ The subspace associated with the affine space L is given by $\{(x, x) : x \in \mathbb{R}\}$.

6406532306474. ✔ The subspace associated with the affine space L' is given by $\{(x, y, z) : x - y + z = 0\}$

6406532306475. ✖ The subspace associated with the affine space L' is the xz- plane.

Question Number : 56 Question Id : 640653689454 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Short Answer Question

If the dimension of L is m and
the dimension of L' is n,
then $m + n$ is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Sub-Section Number :	5
Sub-Section Id :	640653100812
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653689455 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (57 to 58)

Question Label : Comprehension

Let $W = \{(x, y, z) : x + 2y - z = 0\}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 57 Question Id : 640653689456 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Which of the following is a basis β for W?

Options :

6406532306477. ✖ {(1, 0, −1),(0, 1, 2)}

6406532306478. ✔ {(1, 0, 1),(0, 1, 2)}

6406532306479. ✖ {(1, 0, 1),(0, 1, 1)}

6406532306480. ✖ {(−1, 0, −1),(0, 2, 1)}

Question Number : 58 Question Id : 640653689457 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

If γ is the orthonormal basis of W obtained from the basis β by using the Gram Schmidt process with respect to the usual inner product and (a, b, c) is the projection of (1,3,1) onto W, then what is $a + b + c$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Id : 640653689461 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (59 to 60)

Question Label : Comprehension

Consider the following system of linear equations:

$$\begin{aligned} x + 3y - 2z &= 0 \\ y - z &= 0 \\ x + y &= 0 \end{aligned}$$

Let A be the coefficient matrix corresponding to this system.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 59 Question Id : 640653689462 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is the nullspace of A?

Options :

6406532306494. ✔ span{(−1, 1, 1)}

6406532306495. ✖ span{(1, 1, 0)}

6406532306496. ✖ span{(1, 0, 1),(0, 1, −1)}

6406532306497. ✖ span{(1, 1, 0),(0, 1, −1)}

Question Number : 60 Question Id : 640653689463 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Let *B* be a square matrix of order 3. What is the smallest value that the nullity of *BA* could take?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653689464 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (61 to 62)

Question Label : Comprehension

Consider a vector space V with bases $\beta = \{v_1, v_2\}$ and $\gamma = \{v_1 + v_2, v_1 - v_2\}$.
T is a linear transformation from V to itself such that $T(v_1) = v_1 + 2v_2$
and $T(v_2) = 2v_1 - v_2$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 61 Question Id : 640653689465 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Find the matrix corresponding to T
if γ is used as the basis for both
the domain and co-domain.

Options :

6406532306499. ✔ $\begin{bmatrix} 2 & 1 \\ 1 & -2 \end{bmatrix}$

6406532306500. ✖ $\begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$

6406532306501. ✖ $\begin{bmatrix} 3 & -1 \\ 1 & 3 \end{bmatrix}$

6406532306502. ✖ $\begin{bmatrix} 1.5 & 0.5 \\ -0.5 & 1.5 \end{bmatrix}$

Question Number : 62 Question Id : 640653689466 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1

Question Label : Multiple Choice Question

Is *T* an isomorphism?

Options :

6406532306503. ✔ Yes

6406532306504. ✖ No

Statistics2

Section Id :	64065348503
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory