6406532577250. ✖ 70

6406532577251. ✔ 80

6406532577252. ✖ 90

6406532577253. ✖ 85

Maths2

Section Id :	64065353260
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
Section Negative Marks :	0
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 :	640653112576
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 54 Question Id : 640653770456 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 :

6406532577268. ✔ YES

6406532577269. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	640653112577
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770457 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 58)

Question Label : Comprehension

$T : \mathbb{R}^2 \to \mathbb{R}^2$ is a linear transformation given by $T(2,1) = (-1,-3)$ and $T(1,2) = (-5,0)$. The matrix representation of T with respect to the standard ordered basis $\beta = \{(1,0),(0,1)\}$ is $\begin{bmatrix} a & c \\ b & d \end{bmatrix}$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 55 Question Id : 640653770458 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

Find the value of a.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 56 Question Id : 640653770459 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

Find the value of b.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-2

Question Number : 57 Question Id : 640653770460 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

Find the value of *c*.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-3

Question Number : 58 Question Id : 640653770461 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

Find the value of *d*.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Id : 640653770475 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

Let $V = \left\{ \begin{pmatrix} x & -x \\ y & -y \end{pmatrix} : x, y \in \mathbb{R} \right\}$ and $T: V \to \mathbb{R}^3$ be a linear transformation given by $T\left(\begin{pmatrix} x & -x \\ y & -y \end{pmatrix}\right) = (x, y, x+y)$. Based on this information, answer the given subquestions.

Sub questions

Question Number : 59 Question Id : 640653770476 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

Choose the correct option(s) from the following:

Options :

6406532577299. ✖ T is one-one and onto.

6406532577300. ✔ T is one-one but not onto.

6406532577301. ✖ T is not one-one but onto.

6406532577302. ✖ T is neither one-one nor onto.

Question Number : 60 Question Id : 640653770477 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(s) from the following:

Options :

6406532577303. ✖ A basis of V is given by $\left\{ \begin{pmatrix} 1 & -1 \\ 1 & -1 \end{pmatrix}, \begin{pmatrix} 1 & -1 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 1 & -1 \end{pmatrix} \right\}$.

6406532577304. ✔ Any matrix in V has rank less than or equal to 1.

6406532577305. ✔ $\text{Rank}(T)$ is 2.

6406532577306. ✖ $\dim(V)$ is 3.

Sub-Section Number :	3
Sub-Section Id :	640653112578
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770462 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 63)

Question Label : Comprehension

Let *V* and *W* be two vector spaces. Suppose there exists an isomorphism *T* from *V* to *W*

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 61 Question Id : 640653770463 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 statements is true?

Options :

6406532577274. ✔ dim(*V*) = dim(*W*)

6406532577275. ✖ dim(*V*) < dim(*W*)

6406532577276. ✖ dim(V) > dim(W)

6406532577277. ✖ Insufficient information

Question Number : 62 Question Id : 640653770464 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 the following statement true or false?

If $\{v_1, v_2, v_3\}$ are linearly independent vectors in V, then $\{T(v_1), T(v_2), T(v_3)\}$ are linearly independent vectors in W.

Options :

6406532577278. ✔ TRUE

6406532577279. ✖ FALSE

Question Number : 63 Question Id : 640653770465 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 the following statement true or false?

Let $\{u_1, u_2, u_3\} \subset V$. If $\{T(u_1), T(u_2), T(u_3)\}$ is a linearly independent set in W, then $\{u_1, u_2, u_3\}$ is not necessarily a linearly independent set in V. In other words, $\{u_1, u_2, u_3\}$ could also be linearly dependent in V.

Options :

6406532577280. ✖ TRUE

6406532577281. ✔ FALSE

Question Id : 640653770466 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 : (64 to 66)

Question Label : Comprehension

Let $T : \mathbb{R}^3 \to \mathbb{R}^3$ be a linear transformation given by:

$$T(x, y, z) = (x - y, y - z, z - x)$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 64 Question Id : 640653770467 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

Find the nullity of T.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 65 Question Id : 640653770468 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 for the kernel of T?

Options :

6406532577283. ✔ $\{(1,1,1)\}$

6406532577284. ✖ $\text{span}\{(1,1,1)\}$

6406532577285. ✖ $\{(a,a,a) \mid a \in \mathbb{R}\}$

6406532577286. ✖ $\{(1,0),(0,1)\}$

6406532577287. ✖ $\{(1,0,0),(0,1,0)\}$

Question Number : 66 Question Id : 640653770469 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 for the image of T?

Options :

6406532577288. ✔ $\{(1,0,-1),(-1,1,0)\}$

6406532577289. ✖ $\{(1,0,-1),(-1,1,0),(0,-1,1)\}$

6406532577290. ✖ $\{(1,0,0),(0,1,0),(0,0,1)\}$

6406532577291. ✖ $\{(1,0,0),(0,1,0)\}$

Question Id : 640653770471 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 : (67 to 69)

Question Label : Comprehension

Let $W = span\{(1,0,-1),(3,1,2),(2,1,3)\}$ and P_W be the projection of $\mathbb{R}^3$ onto W.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 67 Question Id : 640653770472 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

What is rank of P_W?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 68 Question Id : 640653770473 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

What is nullity of P_W?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 69 Question Id : 640653770474 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

What is $dim(W^{\perp})$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Sub-Section Number :	4
Sub-Section Id :	640653112579
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770479 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 : (70 to 71)

Question Label : Comprehension

Answer the given subquestions:

Sub questions

Question Number : 70 Question Id : 640653770480 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

Let A and B be $n \times n$ similar matrices. Suppose A has exactly $n-1$ linearly independent columns, then $det(B)$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 71 Question Id : 640653770481 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

Let A be a 5×5 matrix of rank 3. Let b be the third column of A and W be the affine subspace of $\mathbb{R}^5$ given by $W = \{x \in \mathbb{R}^5 : Ax = b\}$. What is the dimension of W?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number :	5
Sub-Section Id :	640653112580
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 72 Question Id : 640653770470 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

Select all true statement(s).

Options :

6406532577292. ✔ A and B are square matrices of order n. If $\text{rank}(A) = k$, with $k \leqslant n$, and $\text{rank}(B) = n$, then $\text{rank}(AB) = k$.

6406532577293. ✔ The rank of a matrix is equal to the maximum number of linearly independent columns.

6406532577294. ✖ The rank of a diagonal matrix is equal to the number of diagonal entries that are zero.

6406532577295. ✖ For a matrix A of dimensions $m \times n$, $\text{rank}(A) + \text{nullity}(A) = m$.

Sub-Section Number :	6
Sub-Section Id :	640653112581
Question Shuffling Allowed :	Yes

Is Section Default? :	null

Question Number : 73 Question Id : 640653770478 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Choose the correct option(s) from the following:

Options :

6406532577307. ✔ If A and B are orthogonal matrices, then AB is also orthogonal.

6406532577308. ✔ If A is orthogonal, then A^{-1} is also an orthogonal matrix.

6406532577309. ✖ Let A be an $n \times n$ orthogonal matrix. Let R be the set of rows of A, thought of as a subset of R^n. Similarly, let C be the set of columns of A. Then exactly one of R or C is an orthogonal subset of vectors.

6406532577310. ✔ If A is an $n \times n$ orthogonal matrix, then $\|Ax\| = \|x\|$ for any $x \in \mathbb{R}^n$.

Statistics2

Section Id :	64065353261
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
Section Marks :	40
Display Number Panel :	Yes