Exam : Quiz 2
Subject : Maths2
Total Marks : 25.00
QP : 2022 Nov: IIT M FOUNDATION AN4 EXAM 20

Exam Mode | Learning Mode

QUESTION MENU

1 2 3 4 5 6 7 8 9
10 11 12 13 14 15 16 17 18
19 20 21

TIMER

00:18

CONTROLS

SUBMIT EXAM

Your Score
0.00 / 25.00
(0%)

Question 1 : 640653445384

Total Mark : 0.00 | Type : MCQ

THIS IS QUESTION PAPER FOR THE SUBJECT " FOUNDATION LEVEL:SEMESTER 2/DIRECT ENTRY DIPLOMA : MATHEMATICS FOR DATA SCIENCE 2"

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 :

◯ YES

◯ NO

Your score : 0

Discussions (0)

Question 2 : 640653445400

View Solutions (0) Total Mark : 2.00 | Type : MSQ

Which of the following options is/are true?

OPTIONS :

☐ Every matrix is similar to itself.

☐ If A is similar to B, then A^{-1} is similar to B^{-1}.

☐ $\begin{bmatrix} 2 & 1 \\ 0 & 2 \end{bmatrix}$ is similar to $\begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$.

☐ If A is similar to $B + C$, then $rank(A) = rank(B) + rank(C)$.

Your score : 0

Discussions (0)

Question 3 : 640653445385

View Solutions (0) Total Mark : 3.00 | Type : MSQ

Which of the following options is/are true?

OPTIONS :

☐ If A is a non-zero matrix of order 4×3 and rank of A is 3, then the rows of A arelinearly independent.

☐ If A is a non-zero matrix of order 4 × 3 and rank of A is 3, then the columns of Aare linearly independent.

☐ If A is a non-zero matrix of order m × (m + 1), m > 1, then the maximumpossible nullity of A is m.

☐ If A is a non-zero matrix of order 4 × 5 and rank of A is 3, then the dimension ofthe solution space of the homogeneous system Ax = 0 is 2.

Your score : 0

Discussions (0)

Question 4 : 640653445389

Total Mark : 0.00 | Type : COMPREHENSION

Let W be a proper subspace of an inner product space V , where dim(V) = 3 and PW be the projection of V on W. Answer the subquestion based on the given data.

Your score : 0

Question 5 : 640653445390

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

If $v \in V$ is vector of norm 5, then the maximum possible norm of the vector $P_W(v)$ is

Answer (Numeric):

Answer

Accepted Answer : 5

Your score : 0

Discussions (0)

Question 6 : 640653445391

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following option is/are true?

OPTIONS :

- [ ] Let $v \in V$, then $v - P_W(v)$ is orthogonal to W.
- [ ] If dimension of W is 2, then dimension of the null space of P_W may not be 1.
- [ ] Zero vector is orthogonal to every vector of V.
- [ ] If $v \in W$, then $P_W(v) = v$.

Your score : 0

Discussions (0)

Question 7 : 640653445386

Total Mark : 0.00 | Type : COMPREHENSION

Consider $V = \mathbb{R}^2$ with respect to the inner product defined as

$\langle (x_1, x_2), (y_1, y_2) \rangle = x_1y_1 - (x_1y_2 + x_2y_1) + 2x_2y_2$, for all $(x_1, x_2), (y_1, y_2) \in \mathbb{R}^2$

Answer the Subquestions based on the given data.

Your score : 0

Question 8 : 640653445387

View Parent QN | View Solutions (0)

Total Mark : 2.00 | Type : SA

Find $||(1,3)||^2$.

Answer (Numeric):

Answer

Accepted Answer : 13

Your score : 0

Discussions (0)

Question 9 :
640653445388

View Parent QN | View Solutions (0)

Total Mark : 2.00 | Type : MSQ

Which of the following is/are unit vectors in V ?

OPTIONS :

- ☐ $(1, 1)$
- ☐ $\frac{1}{2}(2, 2)$
- ☐ $\frac{1}{\sqrt{13}}(2, 3)$
- ☐ $(0, 1)$
- ☐ None of these

Your score : 0

Discussions (0)

Question 10 : 640653445396

Total Mark : 0.00 | Type : COMPREHENSION

Consider two linear transformations $T : \mathbb{R}^3 \to \mathbb{R}^2$ such that $T(x, y, z) = (x + y, y + z)$ and $S : \mathbb{R}^2 \to \mathbb{R}^3$ such that $S(x, y) = (x, y, x + y)$. Let $\beta = \{(1, 0, 0), (0, 1, 0), (0, 0, 1)\}$ be an ordered basis for $\mathbb{R}^3$ and $\gamma = \{(1, 0), (0, 1)\}$ be an ordered basis for $\mathbb{R}^2$. Answer the subquestions based on the given data.

Your score : 0

Question 11 :
640653445397

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

If A is the matrix representation of $S \circ T$ (the transformation defined by $(S \circ T)(x, y, z) = S(T(x, y, z))$ with respect to the ordered basis β for both the domain and codomain and order of A is $m \times n$, then find the value of $m + n$.

Answer (Numeric):

Answer

Accepted Answer : 6

Your score : 0

Discussions (0)

Question 12 :
640653445398

View Parent QN | View Solutions (0)

Total Mark : 2.00 | Type : SA

If $K = \{(x, y, z) \mid ax + by = 0, cy + dz = 0\}$ is the null space of $S \circ T$, then find the value of $(\frac{a}{b}) - 2(\frac{c}{d})$

Answer (Numeric):

Answer

Accepted Answer : -1

Your score : 0

Discussions (0)

Question 13 : 640653445399

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

Rank of $S \circ T$ is

Answer (Numeric):

Answer

Accepted Answer : 2

Your score : 0

Discussions (0)

Question 14 : 640653445392

Total Mark : 0.00 | Type : COMPREHENSION

Consider a linear transformation $T : \mathbb{R}^3 \to \mathbb{R}^2$ such that the matrix representation of T is $A = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 2 & 3 \end{bmatrix}$ with respect to the ordered bases $\beta = \{(1,0,0),(0,1,0),(1,1,1)\}$ and $\gamma = \{(1,0),(1,1)\}$ for the domain and codomain, respectively. Answer the subquestions based on the given data.

Your score : 0

Question 15 : 640653445393

View Parent QN | View Solutions (0)

Total Mark : 2.00 | Type : SA

Nullity of the matrix A is

Answer (Numeric):

Answer

Accepted Answer : 1

Your score : 0

Discussions (0)

Question 16 :
640653445394

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

Which of the following option is true?

OPTIONS :

- ◯ T is one-one.
- ◯ T is onto.
- ◯ T is an isomorphism.
- ◯ T is neither one-one nor onto.

Your score : 0

Discussions (0)

Question 17 :
640653445395

View Parent QN | View Solutions (0)

Total Mark : 2.00 | Type : SA

If $T(x, y, z) = (mx + ny + sz, px + qy + rz)$,

then find the value of

$(m + n + s) - 3(p + q + r)$

Answer (Numeric):

Answer

Accepted Answer : -6

Your score : 0

Discussions (0)

Question 18 : 640653445401

Total Mark : 0.00 | Type : COMPREHENSION

The teacher asked Soumya and Sohini to consider an affine space each. Soumya considered the affine subspace L and Sohini considered the affine subspace L' of $\mathbb{R}^3$, where $L = U$ and $L' = (2,0,1) + U'$, for some vector subspaces $U = Span\{(2,0,1),(1,1,0),(0,1,0)\}$ and $U' = Span\{(1,0,1),(0,1,1)\}$ of $\mathbb{R}^3$. Suppose there is a linear transformation $T : U \to U'$ such that $(0,1,0) \in ker(T)$, $T(2,0,1) = (0,1,1)$ and $T(1,1,0) = (1,0,1)$. An affine mapping $f : L \to L'$ is obtained by defining $f(u) = (2,0,1) + T(u)$, for all $u \in U$. By using the above information answer the given subquestions:

Your score : 0

Question 19 : 640653445402

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

Which of the following affine subspaces was considered by Soumya?

OPTIONS :

- $L = \{(x,y,z) \mid x - y - 2z = 0\}$
- $L = \{(x,y,z) \mid x + y - z = 1\}$

- ○ $L = \{(x, y, z) \mid x + y - z = 0\}$
- ○ $L = \mathbb{R}^3$

Your score : 0

Discussions (0)

Question 20 :
640653445403

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : MCQ

Which of the following affine subspaces was considered by Sohini?

OPTIONS :

- ○ $L' = \{(x, y, z) \mid x - y - 2z = 0\}$
- ○ $L' = \{(x, y, z) \mid x + y - z = 1\}$
- ○ $L' = \{(x, y, z) \mid x + y - z = 0\}$
- ○ $L' = \mathbb{R}^3$

Your score : 0

Discussions (0)

Question 21 :
640653445404

View Parent QN | View Solutions (0)

Total Mark : 3.00 | Type : MCQ

Which of the following functions represents f correctly?

OPTIONS :

- ○ $f(x, y, z) = (x - 2z + 2, z, x - z + 1)$
- ○ $f(x, y, z) = (x - 2z + 2, \frac{x}{2}, x - z + 1)$

- ○ $f(x, y, z) = (x - 2z, z, x - z)$
- ○ It cannot be determined from the given information.

Your score : 0

Discussions (0)

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