Question Number : 129 Question Id : 640653738240 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

Choose the correct answer for blank (5).

Options :

6406532470446. ✔ Because

6406532470447. ✖ But

6406532470448. ✖ As ever

6406532470449. ✖ After all

Sem2 Maths2

Section Id :	64065351399
Section Number :	6
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 : 640653107947

Question Shuffling Allowed : No

Is Section Default? : null

Question Number : 130 Question Id : 640653738256 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 : SEMESTER II: 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 :

6406532470507. ✔ YES

6406532470508. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 640653107948

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653738257 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 : (131 to 132)

Question Label : Comprehension

Answer the given subquestions:

Sub questions

Question Number : 131 Question Id : 640653738258 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

Find the determinant of $\begin{bmatrix} 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-1

Question Number : 132 Question Id : 640653738259 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

Find the determinant of $\begin{bmatrix} a & b & 0 & c \\ d & e & 5 & f \\ g & h & 4 & i \\ 0 & 0 & -5 & 0 \end{bmatrix}$ given

the determinant of the matrix $\begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$ is 2.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Id : 640653738272 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 : (133 to 135)

Question Label : Comprehension

Let $V = \{(x, y, 5) : x, y \in \mathbb{R}\}$. Let us define addition and scalar multiplication as follows:

$Addition : (x_1, y_1, 5) + (x_2, y_2, 5) = (x_1 + x_2, y_1 + y_2, 5); (x_1, y_1, 5), (x_2, y_2, 5) \in V$

$Scalar\ multiplication : c(x, y, 5) = (cx, cy, 5); (x, y, 5) \in V, c \in \mathbb{R}$

Answer the given subquestions with respect to the given information.

Sub questions

Question Number : 133 Question Id : 640653738273 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 set *V* closed under addition?

Options :

6406532470527. ✔ Yes

6406532470528. ✖ No

Question Number : 134 Question Id : 640653738274 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 set V closed under scalar multiplication?

Options :

6406532470529. ✔ Yes

6406532470530. ✖ No

Question Number : 135 Question Id : 640653738275 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 is(are) correct?

Options :

6406532470531. ✖ V has no zero element with respect to the given addition.

6406532470532. ✖ $(0, 0, 0)$ is the zero element of V with respect to the given addition.

6406532470533. ✔ $(0, 0, 5)$ is the zero element of V with respect to the given addition.

6406532470534. ✖ For any real number c, we always have $c(0, 1, 5) = (0, 1, 5)$.

6406532470535. ✔ For each element of $v \in V$ and for each pair $a, b \in \mathbb{R}$, $(a + b)v = av + bv$.

Sub-Section Number :	3
Sub-Section Id :	640653107949
Question Shuffling Allowed :	No

Is Section Default? : null

Question Id : 640653738260 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 : (136 to 137)

Question Label : Comprehension

$$\text{Let } A = \begin{bmatrix} 1 & \frac{1}{3} \\ c & d \end{bmatrix} \text{ such that } A^2 = 0.$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 136 Question Id : 640653738261 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 : 137 Question Id : 640653738262 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

Sub-Section Number :	4
Sub-Section Id :	640653107950
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653738263 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 : (138 to 139)

Question Label : Comprehension

Consider the following system of linear equations:

$$\begin{aligned} 2x - y + 3z &= 0 \\ ax - y + z &= 0 \\ 4x - 2y + 7z &= 0 \end{aligned}$$

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 138 Question Id : 640653738264 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

Does there exist an a such that the system has infinitely many solutions? If yes, find the value of a, else write the answer as 100.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 139 Question Id : 640653738265 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

Does there exist an a such that the system has no solution? If yes, find the value of a, else write the answer as 100.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

100

Question Id : 640653738267 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 : (140 to 142)

Question Label : Comprehension

Consider the following subsets of $M_{3\times3}(\mathbb{R})$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 140 Question Id : 640653738268 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

$$W_1 = \left\{ \begin{pmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{pmatrix} : a, b, c \in \mathbb{R} \text{ such that } a + b + c = 1 \right\}.$$

If W_1 is a subspace, find the dimension else write the answer as 0.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 141 Question Id : 640653738269 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

$$W_2 = \left\{ \begin{pmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{pmatrix} : a, b, c \in \mathbb{R} \text{ such that } a = b = c \right\}.$$

If W_2 is a subspace, find the dimension else write the answer as 0.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 142 Question Id : 640653738270 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

$W_3 = \left\{ \begin{pmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{pmatrix} : a, b, c \in \mathbb{R} \right\}$. If W_3 is a subspace, find the dimension else write the answer as 0.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Id : 640653738276 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 : (143 to 145)

Question Label : Comprehension

Let $u = (1, 2, -1)^T$, $v = (2, 1, 0)^T$ and $w = (-1, 4, -3)^T$. Let $A \in M_{3\times3}(\mathbb{R})$ such that $Au = u$ and $Av = -v$. If $A^3w = (a, b, c)^T$, then answer the given subquestions.

Sub questions

Question Number : 143 Question Id : 640653738277 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

a is equal to

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Question Number : 144 Question Id : 640653738278 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

b is equal to

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

Question Number : 145 Question Id : 640653738279 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

c is equal to

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 :	640653107951
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 146 Question Id : 640653738266 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

Select all true statements.

Options :

6406532470515. ✔ $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 2 \\ 0 & 0 & 0 & 0 \end{bmatrix}$ is in reduced row echelon form.

6406532470516. ✔ The reduced row echelon form of any square, invertible matrix is the identity matrix of the same order.

6406532470517. ✖ Elementary row operations can be performed only on square matrices.

6406532470518. ✖ If a matrix is in reduced row echelon form, its last row will always be a zero row.

Question Number : 147 Question Id : 640653738271 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

Consider the vectors $v_1 = (1, -1, 0)$, $v_2 = (2, 3, -1)$ and $v_3 = (a, b, c)$ in $\mathbb{R}^3$. Choose the correct options from the following.

Options :

6406532470522. ✖ If $a = 5, b = 0, c = -1$, then the set $\{v_1, v_2, v_3\}$ forms a basis for $\mathbb{R}^3$.

6406532470523. ✔ If $a = 5, b = 0, c = -1$, then the vectors $\{v_1, v_2, v_3\}$ are linearly dependent.

6406532470524. ✖ If $a = 5, b = 0, c = -1$ and A is the matrix with v_1, v_2 and v_3 as its columns, then $rank(A) = 3$.

6406532470525. ✔ If $a = 2, b = 3, c = 1$, then the subspace spanned by the vectors $\{v_1, v_2, v_3\}$ has dimension 3.

6406532470526. ✔ If $a = 2, b = 3, c = 1$ and A is the matrix with v_1, v_2 and v_3 as its columns, then A is invertible.

Sem2 Statistics2

Section Id :	64065351400
Section Number :	7
Section type :	Online