

Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
6

Question Number : 163 Question Id : 640653903709 Question Type : SA Calculator : None
Correct Marks : 2
Question Label : Short Answer Question

Calculate the value of $\frac{P(X = 0)}{P(X = 1)}$.

Enter the answer correct to two
decimal places.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :
0.05 to 0.11

Sem2 Maths2

Section Id :	64065364118
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134004
Question Shuffling Allowed :	No

Question Number : 164 Question Id : 640653903721 Question Type : MCQ Calculator : Yes

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 :

6406533043234. ✓ YES

6406533043235. ✗ NO

Sub-Section Number :

2

Sub-Section Id :

640653134005

Question Shuffling Allowed :

Yes

Question Number : 165 Question Id : 640653903722 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Let A and B be two matrices such that AB is a square matrix. Consider the two statements given below:

Statement-P: If AB is invertible, both A and B are square invertible matrices.

Statement-Q: Both A and B are square matrices.

Options :

6406533043236. ✗ Statement-P is true, but statement-Q is false.

6406533043237. ✗ Statement-P is false, but statement-Q is true.

6406533043238. ✗ Both statements are true.

6406533043239. ✓ Both statements are false.

Question Number : 166 Question Id : 640653903723 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the following system of equations:

$$\begin{aligned}x_1 - 3x_2 + x_3 &= b_1 \\ -x_1 + 2x_2 - x_3 &= b_2 \\ x_1 - 4x_2 + x_3 &= b_3\end{aligned}$$

Under which of the following conditions is the system consistent?

Options :

6406533043240. ✖ $b_1 = 0$

6406533043241. ✖ $b_1 = -b_2$

6406533043242. ✖ $b_3 = b_1 + b_2$

6406533043243. ✔ $b_3 = 2b_1 + b_2$

Question Number : 167 Question Id : 640653903724 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

Which of the following is an orthonormal basis for $\text{span} \{(1, 0, 1), (0, 1, -1)\}$?

Options :

6406533043244. ✔ $\left\{ \frac{(1, 0, 1)}{\sqrt{2}}, \frac{(1, 2, -1)}{\sqrt{6}} \right\}$

6406533043245. ✖ $\left\{ \frac{(1, 0, 1)}{\sqrt{2}}, \frac{(-1, 0, 1)}{\sqrt{2}} \right\}$

6406533043246. ✖ $\left\{ \frac{(0, 1, -1)}{\sqrt{2}}, \frac{(1, -1, -1)}{\sqrt{3}} \right\}$

6406533043247. ✖ $\left\{ \frac{(1, 0, 1)}{\sqrt{2}}, \frac{(0, 1, -1)}{\sqrt{2}} \right\}$

Sub-Section Number :

3

Sub-Section Id :

640653134006

Question Shuffling Allowed :

Yes

Question Number : 168 Question Id : 640653903725 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Let $S = \{u_1, u_2, u_3, u_4, u_5\}$ be a spanning set for a vector space V . Select all true statements.

Options :

6406533043248. ✓ There exists a basis B for V such that $B \subseteq S$

6406533043249. ✓ $\dim(V) \leq 5$

6406533043250. ✗ S is a subset of every basis B

6406533043251. ✗ S is a superset of every basis B

Question Number : 169 Question Id : 640653903726 Question Type : MSQ Calculator : Yes

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the function f :

$$f(x, y) = \begin{cases} \frac{\sin(x^3 + y^3)}{x^2 + y^2}, & (x, y) \neq (0, 0) \\ 0, & (x, y) = (0, 0) \end{cases}$$

If f_x, f_y denote the partial derivatives, select all true statements from the options given below.

Options :

6406533043252. ✗ $f_x(0, 0)$ does not exist.

6406533043253. ✗ $f_y(1, 0)$ does not exist.

6406533043254. ✓ $f_x(0, 0) = 1$

6406533043255. ✓ $f_y(1, 0) = 0$

Sub-Section Number :

4

Sub-Section Id :

640653134007

Question Shuffling Allowed :

Yes

Question Number : 170 Question Id : 640653903727 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Find the dimension of the affine subspace corresponding to the set of all solutions to the following system:

$$\begin{bmatrix} 1 & -1 & 1 & 0 \\ 2 & 1 & 0 & 3 \\ 3 & 0 & 1 & 3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} 1 \\ 3 \\ 4 \end{bmatrix}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 171 Question Id : 640653903728 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Let $v = (-\sqrt{2}, \sqrt{2}, 5) \in \mathbb{R}^3$. (a, b, c) is the vector obtained from v after rotating $\mathbb{R}^3$ clockwise by 45° about the Z-axis. Find the value of $a + b + c$.

Enter the nearest integer as your answer.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

7

Question Number : 172 Question Id : 640653903729 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Consider $\lim_{(x,y) \rightarrow (0,0)} \frac{x^2}{x^2 + y^2}$. Enter the limit if it exists, enter -1 if it doesn't.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-1

Question Number : 173 Question Id : 640653903730 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Consider the following function:

$$f(x, y) = \begin{cases} \frac{x - y - 1}{\sqrt{x} - \sqrt{y + 1}}, & x \geq 0, y \geq -1, x \neq y + 1 \\ c, & \text{otherwise} \end{cases}$$

For what value of c is the function f continuous at $(1, 0)$? _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 174 Question Id : 640653903731 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

Given $f(x, y) = xy^2 + x^2y$, the direction of steepest ascent of the function at the point $(-2, 1)$ is given by the unit vector (a, b) . Find $b - a$. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 175 Question Id : 640653903733 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

The equation of the tangent line to the function $f(x, y) = e^x(x^2 + y^2)$ at the point $(1, 2)$ in the direction $\left(\frac{3}{5}, \frac{4}{5}\right)$ is given by $\frac{x - 1}{3} = \frac{y - \alpha}{\beta} = \frac{z - \gamma e}{\delta e}$. Find the value of $\alpha + \beta + \gamma + \delta$. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

48

Sub-Section Number : 5

Sub-Section Id : 640653134008

Question Shuffling Allowed : Yes

Question Number : 176 **Question Id :** 640653903732 **Question Type :** SA **Calculator :** None

Correct Marks : 4

Question Label : Short Answer Question

If $A = \begin{bmatrix} 1 & 3 & 4 \\ -1 & 2 & 1 \\ -3 & 9 & 6 \end{bmatrix}$, find the determinant of $A^3 - 2A^2 + 3A$. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Sub-Section Number : 6

Sub-Section Id : 640653134009

Question Shuffling Allowed : No

Question Id : 640653903734 **Question Type :** COMPREHENSION **Sub Question Shuffling Allowed :** No **Group Comprehension Questions :** No **Question Pattern Type :** NonMatrix **Calculator :** None

Question Numbers : (177 to 178)

Question Label : Comprehension

Let $f : D \rightarrow \mathbb{R}$ be defined as follows:

$$f(x, y) = \frac{1}{\sqrt{1 - x^2 - y^2}}$$

where $D \subset \mathbb{R}^2$ is the domain of f .

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 177 Question Id : 640653903735 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

Choose the largest possible D that would be a valid domain from the options given below.

Options :

6406533043263. ✖ $\mathbb{R}^2$

6406533043264. ✖ $\{(x, y) : |x| \leq 1 \text{ and } |y| \leq 1; x, y \in \mathbb{R}\}$

6406533043265. ✔ $\{(x, y) : x^2 + y^2 < 1; x, y \in \mathbb{R}\}$

6406533043266. ✖ $\mathbb{R}^2 \setminus \{(x, y) : x^2 + y^2 \leq 1; x, y \in \mathbb{R}\}$

6406533043267. ✖ $\{(x, y) : x^2 + y^2 \leq 1; x, y \in \mathbb{R}\}$

Question Number : 178 Question Id : 640653903736 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

Which of the following is the range of f using the domain chosen from the previous question? Recall that

$(a, b) = \{x : a < x < b; x \in \mathbb{R}\}$ and

$[a, b] = \{x : a \leq x \leq b; x \in \mathbb{R}\}$

Options :

6406533043268. ✖ $(0, 1)$

6406533043269. ✔ $[1, \infty)$

6406533043270. ✖ $\mathbb{R}$

6406533043271. ✖ $[0, 1]$

Question Id : 640653903737 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (179 to 181)

Question Label : Comprehension

Consider the function $f(x, y) = 3y^2 - 2y^3 - 3x^2 + 6xy$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 179 Question Id : 640653903738 Question Type : SA Calculator : None Correct Marks : 1

Question Label : Short Answer Question

How many critical points does f have?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 180 Question Id : 640653903739 Question Type : SA Calculator : None Correct Marks : 1

Question Label : Short Answer Question

Find the determinant of the Hessian at $(0, 0)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

-72

Question Number : 181 Question Id : 640653903740 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

This function does **not** have a

Options :

6406533043274. ✖ Local maximum

6406533043275. ✔ Local minimum

6406533043276. ✖ Saddle point

Question Id : 640653903741 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (182 to 184)

Question Label : Comprehension

Find three positive numbers x, y, z whose sum is 30 such that xy^2z^2 is maximum.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 182 Question Id : 640653903742 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

Enter the value of x.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

6

Question Number : 183 Question Id : 640653903743 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

Enter the value of y.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

12

Question Number : 184 Question Id : 640653903744 Question Type : SA Calculator : None

Correct Marks : 1

Question Label : Short Answer Question

Enter the value of z.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

12

Sub-Section Number :

7

Sub-Section Id :

640653134010

Question Shuffling Allowed :

No

Question Id : 640653903745 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (185 to 187)

Question Label : Comprehension

Consider a linear transformation $T : \mathbb{R}^3 \rightarrow \mathbb{R}^3$:

$$T(x, y, z) = (y - 2z, x + z, x - y + z)$$

Use the standard basis for both domain and co-domain for matrix representations.

Answer the given sub-questions.

Sub questions

Question Number : 185 Question Id : 640653903746 Question Type : MCQ Calculator : Yes

Correct Marks : 1

Question Label : Multiple Choice Question

What is the matrix representation of T ?

Options :

6406533043280. ✓ $\begin{bmatrix} 0 & 1 & -2 \\ 1 & 0 & 1 \\ 1 & -1 & 1 \end{bmatrix}$

6406533043281. ✗ $\begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & -1 \\ -2 & 1 & 1 \end{bmatrix}$

6406533043282. ✖ $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

6406533043283. ✖ $\begin{bmatrix} 1 & 0 & 1 \\ -1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$

Question Number : 186 Question Id : 640653903747 Question Type : MSQ Calculator : Yes

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select all true statements.

Options :

6406533043284. ✔ The kernel of T is $\{(0, 0, 0)\}$

6406533043285. ✖ The kernel of T is $\mathbb{R}^3$

6406533043286. ✖ The image of T is $\{(0, 0, 0)\}$

6406533043287. ✔ The image of T is $\mathbb{R}^3$

Question Number : 187 Question Id : 640653903748 Question Type : MCQ Calculator : Yes

Correct Marks : 2

Question Label : Multiple Choice Question

T^{-1} is a linear transformation that is the inverse of T . That is, if

$T(x, y, z) = (a, b, c)$, then

$T^{-1}(a, b, c) = (x, y, z)$.

Find the matrix representation of T^{-1} .

Options :

6406533043288. ✔ $\frac{1}{2} \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & -2 \\ -1 & 1 & -1 \end{bmatrix}$

6406533043289. ✖

$$\frac{1}{2} \begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 1 & -2 & -1 \end{bmatrix}$$

6406533043290. ✖ $\begin{bmatrix} 1 & -1 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & -2 \end{bmatrix}$

6406533043291. ✖ $\begin{bmatrix} -1 & -1 & 1 \\ -1 & 0 & 1 \\ 2 & 1 & -1 \end{bmatrix}$

Sem2 Statistics2

Section Id :	64065364119
Section Number :	6
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
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653134011
Question Shuffling Allowed :	No

Question Number : 188 Question Id : 640653903749 Question Type : MCQ Calculator : Yes
Correct Marks : 0

Question Label : Multiple Choice Question

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

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