6406531955934. ✖ [s]

6406531955935. ✔ [z]

6406531955936. ✖ [iz]

Question Number : 57 Question Id : 640653586055 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

The plural markers for the words '*friends*', '*romans*', and '*citizens*' are _____.

Options :

6406531955937. ✖ /s/, /s/, and /s/ respectively

6406531955938. ✖ /z/, /s/, and /z/ respectively

6406531955939. ✔ /z/, /z/, and /z/ respectively

Sem1 Maths1

Section Id :	64065339664
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
Section Marks :	50
Display Number Panel :	Yes
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes

Question Number : 58 Question Id : 640653586056 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 I: MATHEMATICS FOR DATA SCIENCE I (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 :

6406531955940. ✔ YES

6406531955941. ✖ NO

Question Number : 59 Question Id : 640653586057 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

Instructions:

- There are some questions which have functions with discrete valued domains (such as day, month, year etc). For simplicity, we treat them as continuous functions.

- For NAT type question, enter only one right answer even if you get multiple answers for that particular question.

- Notations:
  - ℝ= Set of real numbers
  - ℚ= Set of rational numbers
  - ℤ= Set of integers
  - ℕ= Set of natural numbers

- The set of natural numbers does not include 0.

Options :

6406531955942. ✔ Useful Data has been mentioned above.

6406531955943. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number :   2

Sub-Section Id :   64065383980

Question Shuffling Allowed :   Yes

Is Section Default? :   null

Question Number : 60 Question Id : 640653586058 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Short Answer Question

If n is the number of solutions of the equation $2^{2x+3} - 6 \cdot 2^x + 1 = 0$, then find the value of $4n$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

Question Number : 61 Question Id : 640653586059 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5

Question Label : Short Answer Question

Consider the equation $\log_3(\log_4(x^2+1)^2 + \log_8 8x^3) = 0$. Then find the value of $x(x^2+1) + 7$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

Sub-Section Number :	3
Sub-Section Id :	64065383981
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653586060 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 : (62 to 63)

Question Label : Comprehension

Consider the following functions $f_1 : D_1 \to \mathbb{R}$, $f_2 : D_2 \to \mathbb{R}$, $f_3 : D_3 \to \mathbb{R}$ and $g : D \to \mathbb{R}$, defined as:

- $f_1(x) = \sin 2x$.
- $f_2(x) = \ln(x^2 - 6x + 8)$.
- $f_3(x) = e^{3x} + 5$.
- $g(x) = f_1(x) + f_2(x) + f_3(x)$.

Let D_1, D_2, D_3 and D be the (largest) domains of the functions $f_1(x), f_2(x), f_3(x)$ and $g(x)$, respectively. Use this information to answer the subquestions.

Sub questions

Question Number : 62 Question Id : 640653586061 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

Which of the following options is/are true?

Options :

6406531955946. ✔ $D = D_1 \cap D_2 \cap D_3$.

6406531955947. ✔ $D_1 = D_3$ and $D = D_2$.

6406531955948. ✔ $D = (-\infty, 2) \cup (4, \infty)$.

6406531955949. ✖ $D = (-\infty, 2] \cup [4, \infty)$.

Question Number : 63 Question Id : 640653586062 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following options is/are true?

Options :

6406531955950. ✖ Function $g(x)$ is not differentiable in its domain.

6406531955951. ✔ Function $g(x)$ is continuous in its domain.

6406531955952. ✔ If function $g(x)$ is differentiable in its domain, then derivative of the function is $g'(x) = 2\cos 2x + \frac{2x-6}{x^2-6x+8} + 3e^{3x}$.

6406531955953. ✖ If function $g(x)$ is differentiable in its domain, then derivative of the function is $g'(x) = 2\cos 2x + \frac{1}{x^2-6x+8} + 3e^{3x}$.

Sub-Section Number :	4
Sub-Section Id :	64065383982
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 64 Question Id : 640653586063 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

Which of the following options is/ are true?

Options :

6406531955954. ✖ If a function is continuous at a particular point, then the function is differentiable at that point.

6406531955955. ✔ If a function is differentiable at a particular point, then the function must be continuous at that point.

6406531955956. ✔ If a function is continuous at a particular point, then the limit of the function exists at that point.

6406531955957. ✖ If the limit of a function exists at a particular point, then the function is continuous at that point.

Sub-Section Number :	5
Sub-Section Id :	64065383983
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653586064 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 : (65 to 66)

Question Label : Comprehension

Let $\{a_n\}$ be a sequence defined as $a_n = \frac{2n+1}{4n+3}$. Consider the sequence $\{b_n\}$ defined by $b_n = 4(3a_n^2 + 2a_n + 5)$. Use this information to answer the subquestions.

Sub questions

Question Number : 65 Question Id : 640653586065 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

What is the limit of the sequence $\{a_n\}$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.5

Question Number : 66 Question Id : 640653586066 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

What is the limit of the sequence $\{b_n\}$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

27

Sub-Section Number :	6
Sub-Section Id :	64065383984
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653586067 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 68)

Question Label : Comprehension

Consider three differentiable functions $f(x)$, $g(x)$ and $h(x)$ such that

$f(x) = g(2x^2 + x)h(3x^3 + x)$, $g'(0) = g(0) = 3$, and $h'(0) = h(0) = 1$.

Use this information to answer the subquestions.

Sub questions

Question Number : 67 Question Id : 640653586068 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

Which of the following options is/are true?

Options :

6406531955960. ✖ $f'(x) = (4x + 1)(9x^2 + 1)g'(2x^2 + x)h'(3x^3 + x)$

6406531955961. ✔ $f'(x) = (4x + 1)g'(2x^2 + x)h(3x^3 + x) + (9x^2 + 1)g(2x^2 + x)h'(3x^3 + x)$

6406531955962. ✔ $f'(0) = 2g(0)h(0)$

6406531955963. ✔ $f(0) = g(0)h(0)$

Question Number : 68 Question Id : 640653586069 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 value of $\frac{f'(0)}{f(0)} + \lim\limits_{x \to 0} f(x) + \lim\limits_{x \to 0} g(x) + \lim\limits_{x \to 0} h(x)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

9

Sub-Section Number : 7

Sub-Section Id : 64065383985

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653586070 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 : (69 to 70)

Question Label : Comprehension

Consider the function $f(x)$ given below:

$$f(x) = \begin{cases} 2x^2 sin\left(\dfrac{1}{x}\right) + b & \text{if } x \neq 0, \\ 5 & \text{if } x = 0 \end{cases}$$

Assume that f is continuous at $x = 0$. Use this information to answer the subquestions.

Sub questions

Question Number : 69 Question Id : 640653586071 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 value of b.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 70 Question Id : 640653586072 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

Which of the following options is/are true for the function *f(x)* at *x* = 1?

Options :

6406531955966. ✔ The best linear approximation is $L_f(x) = (4\sin 1 - 2\cos 1)\,x - 2\sin 1 + 2\cos 1 + 5.$

6406531955967. ✖ The best linear approximation is $L_f(x) = (4\sin 1 + 2\cos 1)\,x - 2\sin 1 + 2\cos 1 + 5.$

6406531955968. ✖ The tangent line is $y = (4\sin 1 + 2\cos 1)\,x - 2\sin 1 + 2\cos 1 + 5.$

6406531955969. ✔ The tangent line is $y = (4\sin 1 - 2\cos 1)\,x - 2\sin 1 + 2\cos 1 + 5.$

Sub-Section Number :	8
Sub-Section Id :	64065383986
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 71 Question Id : 640653586073 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

Define a function

$$f(x) = \begin{cases} x^2 + 1 & \text{if } x < 1 \\ x^3 & \text{if } x \geq 1 \end{cases}$$

Which of the following options is/are true?

Options :

6406531955970. ✖ $f(x)$ is invertible in its domain.

6406531955971. ✔ $f(x)$ is invertible when the domain is restricted to $[1, \infty)$.

6406531955972. ✖ $f(x)$ is invertible when the domain is restricted to $[-1, 1]$.

6406531955973. ✔ The inverse of $f(x)$ when the domain is restricted to $[1, \infty)$ is $f^{-1}(x) = x^{\frac{1}{3}}$.

6406531955974. ✖ The inverse of $f(x)$ when the domain is restricted to $(-\infty, 0)$ is $f^{-1}(x) = \sqrt{x-1}$.

Sub-Section Number :	9
Sub-Section Id :	64065383987
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 72 Question Id : 640653586074 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the functions $f(x) = \log x^2$ and $g(x) = 2x + 1$. Which of following options is/are true?

6406531955975. ✔ The domain of the function $(f \circ g)(x)$ is $\mathbb{R} \setminus \{-\frac{1}{2}\}$.

6406531955976. ✖ $(f \circ g)(x) = \log(2x + 1)$.

6406531955977. ✖ The domain of the function $(g \circ f)(x)$ is $\mathbb{R} \setminus \{-\frac{1}{2}\}$.

6406531955978. ✔ $(g \circ f)(x) = 2 \log x^2 + 1$.

6406531955979. ✔ The domain of the function $(g \circ f)(x)$ is $\mathbb{R} \setminus \{0\}$.

Question Number : 73 Question Id : 640653586075 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 5 Max. Selectable Options : 0

Question Label : Multiple Select Question

Define a function

$$f(x) = \begin{cases} \frac{|x-3|}{x-3} & \text{if } x \neq 3 \\ 1 & \text{if } x = 3 \end{cases}$$

Which of the following options is/are true?

Options :

6406531955980. ✔ $\lim\limits_{x \to 3^+} f(x) = f(3)$.

6406531955981. ✖ $\lim\limits_{x \to 3^-} f(x)$ does not exist.

6406531955982. ✔ f is not continuous at $x = 3$.

6406531955983. ✖ f is differentiable at $x = 3$.

6406531955984. ✖ $f'(7) = 1$.

Sem1 Statistics1

Section Id :	64065339665
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	11
Number of Questions to be attempted :	11
Section Marks :	40
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 :	64065383988
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 74 Question Id : 640653586076 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