Correct Marks : 1

Question Label : Multiple Choice Question

For which argument will the function `recursiveFunc()` cause an **error**?

Options :

6406533039087. ✖ `recursiveFunc(1)`

6406533039088. ✖ `recursiveFunc(-1)`

6406533039089. ✔ `recursiveFunc(5)`

6406533039090. ✖ `recursiveFunc(0)`

Sem1 Maths1

Section Id :	64065364071
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	16
Number of Questions to be attempted :	16
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 :	640653133659
Question Shuffling Allowed :	No

Question Number : 44 Question Id : 640653902323 Question Type : MCQ Calculator : Yes

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 :

6406533039091. ✔ YES

6406533039092. ✖ NO

Question Number : 45 Question Id : 640653902324 Question Type : MCQ Calculator : Yes
Correct Marks : 0

Question Label : Multiple Choice Question

Instructions:

- There are some questions that have functions with discrete-valued domains (such as day, month, year etc).
- For NAT-type questions, enter only one right answer even if you get multiple answers for that particular question.
- Notations:
  - $\mathbb{R}$= Set of real numbers
  - $\mathbb{Q}$= Set of rational numbers
  - $\mathbb{Z}$= Set of integers
  - $\mathbb{N}$= Set of natural numbers
- The set of natural numbers includes 0.

Options :

6406533039093. ✔ Instructions has been mentioned above.

6406533039094. ✖ This Instructions is just for a reference & not for an evaluation.

Sub-Section Number : 2
Sub-Section Id : 640653133660
Question Shuffling Allowed : Yes

Question Number : 46 Question Id : 640653902325 Question Type : MSQ Calculator : Yes
Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following is (are) correct?

Options :

6406533039095. ✔ Floyd-Warshall algorithm is used for all pair shortest paths.

6406533039096. ✔ The Shortest path problem is not applicable to a graph with a negative weight

cycle.

6406533039097. ✔ Bellman-Ford algorithm is used for single source shortest path.

6406533039098. ✖ Dijkstra's algorithm is used for all pair shortest paths.

Sub-Section Number : 3

Sub-Section Id : 640653133661

Question Shuffling Allowed : Yes

Question Number : 47 Question Id : 640653902326 Question Type : MSQ Calculator : Yes Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following adjacency matrix

$$\begin{array}{c} \\ A \\ B \\ C \\ D \\ E \end{array} \begin{array}{c} \begin{array}{ccccc} A & B & C & D & E \end{array} \\ \begin{pmatrix} 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{pmatrix} \end{array}$$

which represents graph G which has 5 vertices A, B, C, D and E.

Which of the following is true about the graph G?

Options :

6406533039099. ✖ The number of vertices in *G* of degree 3 are 3.

6406533039100. ✔ The total number of edges in *G* are 7.

6406533039101. ✖ The total number of edges in *G* are 14.

6406533039102. ✔ There is a cycle in *G*.

Question Number : 48 Question Id : 640653902335 Question Type : MSQ Calculator : Yes Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following function:

$$f(x) = \begin{cases} \dfrac{x}{(x+1)(x+2)}, & x \geq 1, \\ \dfrac{1}{x-5}, & x < 1 \end{cases}$$

Which of the following options is (are) correct?

Options :

6406533039115. ✖ $\lim\limits_{x \to -2^+} f(x) = \infty$

6406533039116. ✖

The function f is continuous.

6406533039117. ✔ $\lim_{x\to 5^+} f(x) = \lim_{x\to 5^-} f(x) = \frac{5}{42}$

6406533039118. ✔ At $x = 1$, the function f is discontinuous.

Question Number : 49 Question Id : 640653902336 Question Type : MSQ Calculator : Yes Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following statements is/are true about the function $f(x) = x^2 + 2x - 8$?

Options :

6406533039119. ✖ f is one-one on its domain.

6406533039120. ✖ f has an inverse on its domain.

6406533039121. ✔ The vertex of this parabola is at (-1, -9).

6406533039122. ✔ y- intercept of the given parabola is -8.

Question Number : 50 Question Id : 640653902339 Question Type : MSQ Calculator : Yes Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following relations defined on the set of integers

- $R_1 = \{(x, y) | x, y \in \mathbb{Z} \text{ and } 7 \text{ divides } (x - y)\}$
- $R_2 = \{(x, y) | x, y \in \mathbb{Z} \text{ and } x + y = 2\}$

Choose the correct option(s).

Options :

6406533039131. ✖ R_1 is not transitive.

6406533039132. ✔ R_2 is symmetric.

6406533039133. ✔ R_1 is symmetric.

6406533039134. ✖ R_2 is transitive.

Sub-Section Number : 4

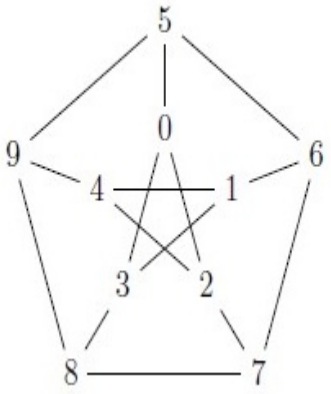
Sub-Section Id : 640653133662

Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 640653902327 Question Type : SA Calculator : None Correct Marks : 4

Question Label : Short Answer Question

What is the minimum number of colours required to colour the graph given below?



Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
3

Question Number : 52 Question Id : 640653902341 Question Type : SA Calculator : None Correct Marks : 4
Question Label : Short Answer Question

You have been closely monitoring your bike's mileage recently. Here is a table showing two rows representing the amount paid for fuel(in ₹) and the corresponding mileage (in Km). Consider y as the amount paid and x as the corresponding mileage in Km. You have noted down the distance traveled each time when the fuel meter falls back to a fixed reference mark and predicted that the equation of the best fit line is $y = 5x - 21$. What will be the value of SSE w.r.t the best fit line?

Amount paid (in ₹)	80	50	60	100	48
Distance (in Km)	20	15	16	25	14

Table: 1

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
35

Sub-Section Number : 5
Sub-Section Id : 640653133663
Question Shuffling Allowed : No

Question Id : 640653902328 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (53 to 54)

Question Label : Comprehension

Consider a weighted graph G with 7 vertices { rows and columns are in the order $V_1, V_2, V_3, V_4, V_5, V_6, V_7$}, which is represented by the following adjacency matrix.

Use the following information for given sub-questions

$$\begin{bmatrix} 0 & 24 & 0 & 0 & 36 & 0 & 28 \\ 24 & 0 & 0 & 32 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 4 & 12 \\ 0 & 32 & 0 & 0 & 8 & 0 & 0 \\ 36 & 0 & 0 & 8 & 0 & 0 & 0 \\ 0 & 0 & 4 & 0 & 0 & 0 & 20 \\ 28 & 0 & 12 & 0 & 0 & 20 & 0 \end{bmatrix}.$$

Sub questions

Question Number : 53 Question Id : 640653902329 Question Type : MCQ Calculator : Yes Correct Marks : 4

Question Label : Multiple Choice Question

Suppose we perform Prim's algorithm on the graph G starting from vertex V_1 to find an MCST. Then the order in which the vertices are added is

Options :

6406533039104. ✖ $V_1, V_3, V_6, V_7, V_2, V_4, V_5$

6406533039105. ✔ $V_1, V_2, V_7, V_3, V_6, V_4, V_5$

6406533039106. ✖ $V_1, V_2, V_4, V_5, V_7, V_3, V_6$

6406533039107. ✖ $V_1, V_3, V_6, V_7, V_5, V_4, V_2$

Question Number : 54 Question Id : 640653902330 Question Type : SA Calculator : None Correct Marks : 2

Question Label : Short Answer Question

Find the value MCST.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

108

Sub-Section Number :	6
Sub-Section Id :	640653133664
Question Shuffling Allowed :	No

Question Id : 640653902332 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (55 to 56)

Question Label : Comprehension

Consider the following functions;

- $v(t) = 4t^2 + 2t$
- $s(t) = 20 + 4t - t^2$

Let [.] be the floor function (greatest integer function), e.g., $[2.34] = 2$, $[5] = 5$.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 55 Question Id : 640653902333 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

If A and B are the areas under the curves $v(t)$ and $s(t)$ respectively, from $t = 0$ to $t = 1$ then what is the value of $[A] + [B]$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

23

Question Number : 56 Question Id : 640653902334 Question Type : SA Calculator : None Correct Marks : 2

Question Label : Short Answer Question

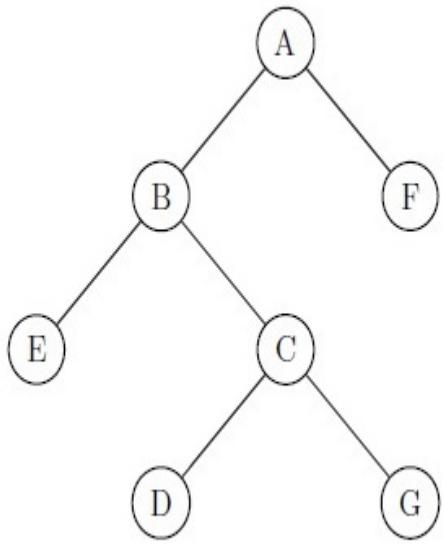
If α and β are the Y-coordinates of the points of intersection of the curves $v(t)$ and $s(t)$ then what is the value of $10(\alpha+\beta)$.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
4

Sub-Section Number :	7
Sub-Section Id :	640653133665
Question Shuffling Allowed :	Yes

Question Number : 57 Question Id : 640653902331 Question Type : MCQ Calculator : Yes
Correct Marks : 3
Question Label : Multiple Choice Question

Suppose we obtain the following BFS tree rooted at node A for an undirected graph with vertices $\{A, B, C, D, E, F, G\}$.



Which of the following cannot be an edge in the original graph?

Options :
6406533039109. ✔ (A,D)
6406533039110. ✖ (E,C)
6406533039111. ✖ (D,G)
6406533039112. ✖ (B,F)

Question Number : 58 Question Id : 640653902337 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

Choose the correct option(s).

Options :

6406533039123. ✔ $\lim_{x\to 0}[x \times sin(\frac{1}{x})] = 0$

6406533039124. ✖ $\lim_{x\to 0} \frac{e^{(1/x)}}{e^{(1/x)}+1} = 0$

6406533039125. ✖ $\lim_{x\to 0}[x \times sin(\frac{1}{x})] = 1$

6406533039126. ✖ $\lim_{x\to 0} \frac{e^{(1/x)}}{e^{(1/x)}+1} = 1$

Sub-Section Number : 8

Sub-Section Id : 640653133666

Question Shuffling Allowed : Yes

Question Number : 59 Question Id : 640653902340 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

Points $A(4,3), B(-3,-4)$ and $C(m,n)$ are collinear. If points $D(-1,2), E(5,-4)$ and C are also collinear, the value of $\frac{4m+9n}{2m+3n}$ is.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Sub-Section Number : 9

Sub-Section Id : 640653133667

Question Shuffling Allowed : Yes

Question Number : 60 Question Id : 640653902338 Question Type : MCQ Calculator : Yes Correct Marks : 4

Question Label : Multiple Choice Question

Consider the functions $f(x) = \sqrt{x+4}$ and $g(x) = \log(1+x^2)$. Which of the following options is/are true?

Options :

6406533039127. ✖ $(f \circ g)(x) = \log(2x+5)$ on its domain of definition.

6406533039128. ✖ The domain of the function $(g \circ f)(x)$ is $(-5, \infty)$.

6406533039129. ✖ The domain of the function $(g \circ f)(x)$ is $[-6, -1]$.

6406533039130. ✔ $(g \circ f)(x) = \log(x+5)$ on its domain of definition.

Sub-Section Number : 10
Sub-Section Id : 640653133668
Question Shuffling Allowed : Yes

Question Number : 61 Question Id : 640653902342 Question Type : MSQ Calculator : Yes
Correct Marks : 2 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider two polynomials $p(x) = -x^5 + 5x^4 - 7x - 2$ and $q(x) = -x^5 + 5x^4 - x^2 - 2$. Which of the following options is/are true?

Options :

6406533039137. ✔ $p(x)$ and $q(x)$ intersect at two points.

6406533039138. ✖ $p(x) \to \infty$ as $x \to \infty$.

6406533039139. ✖ $p(x)$ has 5 turning points.

6406533039140. ✔ $q(x) \to -\infty$ as $x \to \infty$.

Sem1 Statistics1

Section Id : 64065364072
Section Number : 4
Section type : Online
Mandatory or Optional : Mandatory