Options :

6406532327517. ✖ Foolishly

6406532327518. ✖ Bravely

6406532327519. ✔ Understandably

6406532327520. ✖ All of these

Sem1 Maths1

Section Id :	64065349234
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	14
Number of Questions to be attempted :	14
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 :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653103046
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 166 Question Id : 640653696776 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 :

6406532327521. ✔ YES

6406532327522. ✖ NO

Question Number : 167 Question Id : 640653696777 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.

Options :

6406532327523. ✔ Useful Data has been mentioned above.

6406532327524. ✖ This data attachment is just for a reference & not for an evaluation.

Sub-Section Number : 2

Sub-Section Id : 640653103047

Question Shuffling Allowed : Yes

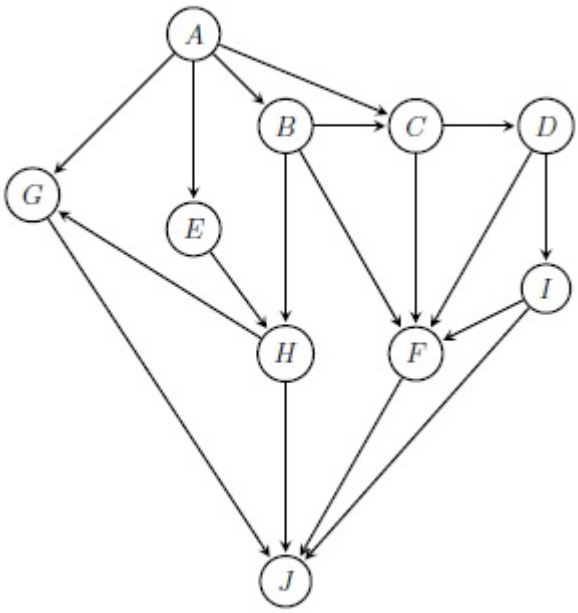
Is Section Default? : null

Question Number : 168 Question Id : 640653696783 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Consider the given graph:



Which of the following orderings is the longest path of the graph?

Options :

6406532327536. ✖ *AEHGIFJ*

6406532327537. ✖ *ABCDFIJ*

6406532327538. ✖ *ABCDIHJ*

6406532327539. ✖ *ABECDFJ*

6406532327540. ✔ *ABCDIFJ*

Sub-Section Number : 3

Sub-Section Id : 640653103048

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 169 Question Id : 640653696779 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 is (are) correct?

Options :

6406532327526. ✔ Floyd–Warshall algorithm does not work for graphs with negative weight cycles.

6406532327527. ✔ Floyd-Warshall algorithm is used for all pair shortest paths.

6406532327528. ✖ The Shortest path problem is applicable to a graph with a negative weight cycle.

6406532327529. ✔ Bellman-Ford algorithm is used for single source shortest path.

6406532327530. ✖ Dijkstra's algorithm is used for all pair shortest paths.

Question Number : 170 Question Id : 640653696794 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 statements is/are true about the function $f(x) = -\left(e^{log(x)}\right)^2$?

Options :

6406532327556. ✖ f is not one-one.

6406532327557. ✖ f does not have an inverse.

6406532327558. ✔ f is a decreasing function.

6406532327559. ✔ The domain of f is $(0, \infty)$

Sub-Section Number : 4

Sub-Section Id : 640653103049

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 171 Question Id : 640653696795 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 is true about the polynomial $f(x) = 2x^3 - 3x^2 - 12x + 4$.

Options :

6406532327560. ✔ $f(x)$ is an increasing function in the interval $[-2, -1]$

6406532327561. ✖ 2 is a root of $f(x)$.

6406532327562. ✔ $f(x) \to \infty$ as $x \to \infty$.

6406532327563. ✔ The quotient obtained while dividing $f(x)$ by $(x + 2)$ a quadratic function.

6406532327564. ✖ $f(x)$ has 3 turning points.

Question Number : 172 Question Id : 640653696796 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

Consider relations R_1 and R_2 on $\mathbb{N}$ i.e., $R_1 \subseteq \mathbb{N} \times \mathbb{N}$ and $R_2 \subseteq \mathbb{N} \times \mathbb{N}$, defined as

$$R_1 = \{(a,b) \mid b \geq a+1, \text{ and } a,b \in \mathbb{N}\}$$

$$R_2 = \{(a,b) \mid b = a, \text{ and } a,b \in \mathbb{N}\}$$

Which of the following option(s) is(are) true?

Options :

6406532327565. ✖ R_1 is reflexive but not symmetric.

6406532327566. ✔ R_2 is both reflexive and symmetric.

6406532327567. ✔ R_1 is transitive.

6406532327568. ✔ R_2 is both reflexive and transitive.

Sub-Section Number :	5
Sub-Section Id :	640653103050
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653696780 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 : (173 to 174)

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

$$\begin{bmatrix} 0 & 12 & 0 & 0 & 18 & 0 & 14 \\ 12 & 0 & 0 & 16 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 2 & 6 \\ 0 & 16 & 0 & 0 & 4 & 0 & 0 \\ 18 & 0 & 0 & 4 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 & 0 & 10 \\ 14 & 0 & 6 & 0 & 0 & 10 & 0 \end{bmatrix}.$$

Sub questions

Question Number : 173 Question Id : 640653696781 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

Suppose we perform Kruskal's algorithm on the graph *G* to find an MCST. Which of the following edges are not added to the minimum cost spanning tree?

Options :

6406532327531. ✔ (V_1, V_5)

6406532327532. ✖ (V_2, V_4)

6406532327533. ✔ (V_7, V_6)

6406532327534. ✖ (V_1, V_7)

Question Number : 174 Question Id : 640653696782 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 MCST.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

54

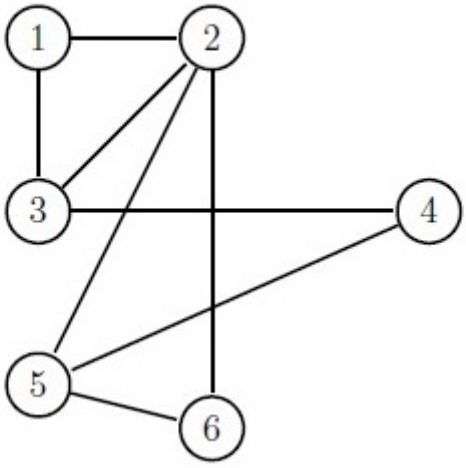
Sub-Section Number :	6
Sub-Section Id :	640653103051
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653696784 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 : (175 to 176)

Question Label : Comprehension

Use the below graph to answer the given sub-questions.



Sub questions

Question Number : 175 Question Id : 640653696785 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?

Options :

6406532327541. ✖ The Degree of each vertex is 3.

6406532327542. ✖ The minimum vertex cover is 4.

6406532327543. ✔ The given graph is planer.

6406532327544. ✔ The minimum number of colors to color the graph is 3.

Question Number : 176 Question Id : 640653696786 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

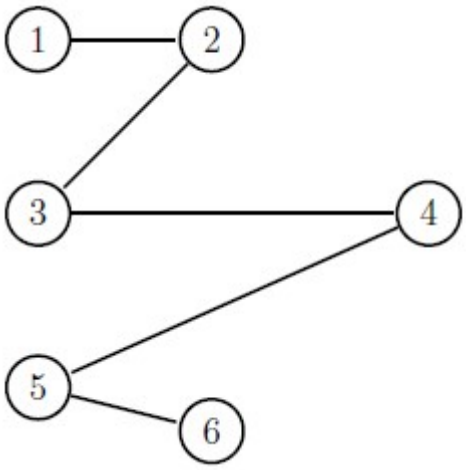
Correct Marks : 3

Question Label : Multiple Choice Question

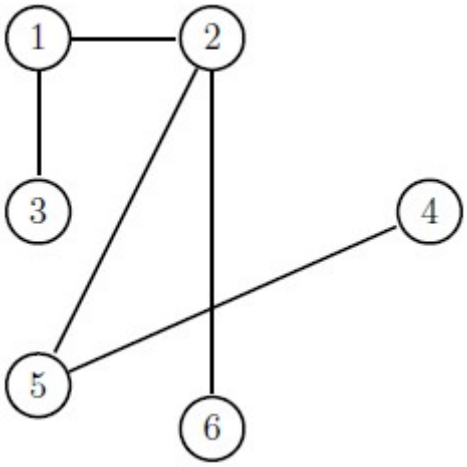
Which of the following is/are the BFS tree starting from vertex 1 of the given graph?

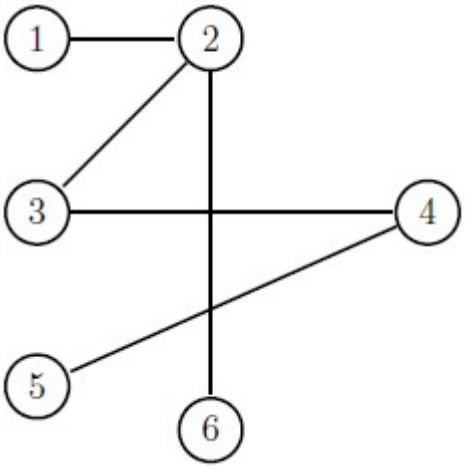
Options :

6406532327545. ✖

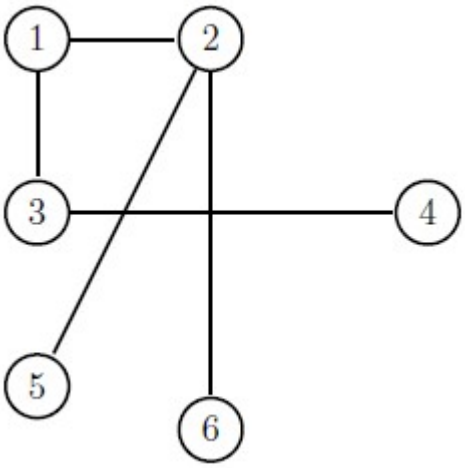


6406532327546. ✖





6406532327547. ✖



6406532327548. ✔

Sub-Section Number :	7
Sub-Section Id :	640653103052
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653696787 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 : (177 to 178)

Question Label : Comprehension

Consider a function $f(x) = 3x + 2$ in the interval $[0, 4]$.
Use this information to answer the given sub-questions.

Sub questions

Question Number : 177 Question Id : 640653696788 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 area under the curve
$f(x)$ in the interval $[0, 4]$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

32

Question Number : 178 Question Id : 640653696789 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Is this statement True or False: If the interval [0, 4] is divided into 4 equal parts, then the left Riemann sum is 26.

Options :

6406532327550. ✔ True

6406532327551. ✖ False

Sub-Section Number : 8

Sub-Section Id : 640653103053

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653696790 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 : (179 to 181)

Question Label : Comprehension

$$f(x) = \begin{cases} k & x \leq 0, \\ \dfrac{1-\cos 4x}{x^2} & x > 0, \end{cases}$$

Consider the function above and answer the given sub-questions.

Sub questions

Question Number : 179 Question Id : 640653696791 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 $\lim_{x \to 0^+} f(x)$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

8

Question Number : 180 Question Id : 640653696792 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Is this statement True or False: If f is continuous at $x = 0$, then it is differentiable at $x = 0$ also.

Options :

6406532327553. ✔ True

6406532327554. ✖ False

Question Number : 181 Question Id : 640653696793 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

Let $a_n = f(n), n > 0$. Find $\lim_{n\to\infty} a_n$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Id : 640653696797 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 : (182 to 184)

Question Label : Comprehension

Consider the function $f(x) = \sin x$. Let ℓ be the tangent line of the function at $x = \frac{1}{2}$.
Use this information to answer the given sub-questions.

Sub questions

Question Number : 182 Question Id : 640653696798 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Is this statement True or False:
The tangent line ℓ has the equation

$$y = \sin\left(\frac{1}{2}\right) - \cos\left(\frac{1}{2}\right)(x - \frac{1}{2}).$$

Options :

6406532327569. ✖ True

6406532327570. ✔ False

Question Number : 183 Question Id : 640653696799 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Multiple Choice Question

Is this statement True or False:

$$\int_0^{\frac{\pi}{2}} f(x)\,dx = 1$$

Options :

6406532327571. ✔ True

6406532327572. ✖ False

Question Number : 184 Question Id : 640653696800 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 this statement True or False: $f(x)$ has infinitely many critical points.

Options :

6406532327573. ✔ True

6406532327574. ✖ False

Sub-Section Number :	9
Sub-Section Id :	640653103054
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 185 Question Id : 640653696778 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Let $PQRS$ be a parallelogram with vertices $P(-1,2)$, $Q(3,-4)$, and $S(8,9)$. Let (x,y) denote the coordinates of the fourth vertex R. Find the area of the $\triangle QRS$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

41

Question Number : 186 Question Id : 640653696801 Question Type : SA Calculator : None

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

Correct Marks : 3

Question Label : Short Answer Question

An LED manufacturer determines that in order to sell x number of LEDs, the price per LED(in thousands) must be $f(x) = 1000 - x$, if $x \leq 800$, and the manufacturer also determines that the total cost(in thousands) of producing x number of LEDs is

$$g(x) = \begin{cases} 30000 + 300x & \text{if } x \leq 400, \\ 100x + 110000 & \text{if } 400 < x \leq 800 \end{cases}$$

Although in the above context, x can take only integer values, assume that x is a continuous variable in the interval $[0, 800]$ and that the functions $f(x)$ and $g(x)$ are defined as above on this entire interval.

Suppose the company can produce a maximum of 400 LEDs due to a production issue. The number of LEDs the company should produce and sell in order to maximize profit is

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

350

Sem1 Statistics1

Section Id :	64065349235
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	13
Number of Questions to be attempted :	13
Section Marks :	40
Display Number Panel :	Yes