Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 19 Question Id : 640653676778 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

A DD-Path consists of decision vertices, each of which has in-degree $\geq x$ or out-degree $\geq x$. What is the value of x?

Do not write the number in words, if your answer is **6**, enter *6* only but not *six*.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

AI

Section Id :	64065345314
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	5

Number of Questions to be attempted :	5
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 :	64065396822
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 20 Question Id : 640653676784 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 "DEGREE LEVEL : AI: SEARCH METHODS FOR PROBLEM SOLVING (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 :

6406532266557. ✔ YES

6406532266558. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	64065396823

Question Shuffling Allowed : No

Is Section Default? : null

Question Id : 640653676785 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 : (21 to 23)

Question Label : Comprehension

STATE SPACE

Recall the rabbits crossing puzzle from the practice assignment. Two groups of rabbits, each group at opposite ends of a path, want to cross the path by making only forward jumps: a rabbit can jump forward to an adjacent empty spot, or jump forward over one rabbit and land in an empty spot.

The start state is **(R-LL)**, where **R** is a rabbit that wants to go right, and **L** is a rabbit that wants to go left, and the dash marks the empty spot.
Construct all the states that are reachable from the start state and build a state space graph out of those states, call it Graph-12.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 21 Question Id : 640653676786 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 states are reachable from the start state in exactly 3 moves?

Options :

6406532266559. ✔ (LRL-)

6406532266560. ✔ (L-RL)

6406532266561. ✖ (RLL-)

6406532266562. ✖ (L-LR)

6406532266563. ✖ (LL-R)

Question Number : 22 Question Id : 640653676787 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

From **(R-LL)**, the minimum number of moves needed to reach **(LL-R)** is _____ .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

5

Question Number : 23 Question Id : 640653676788 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

For Graph-12, which of the following algorithms will find the shortest path from **(R-LL)** to **(LL-R)**? Assume a suitable MoveGen order for each algorithm.

Options :

6406532266565. ✔ Depth First Search

6406532266566. ✔ Breadth First Search

6406532266567. ✔ DFID-C (revisits CLOSED nodes)

Sub-Section Number :	3
Sub-Section Id :	64065396824
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653676789 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 : (24 to 31)

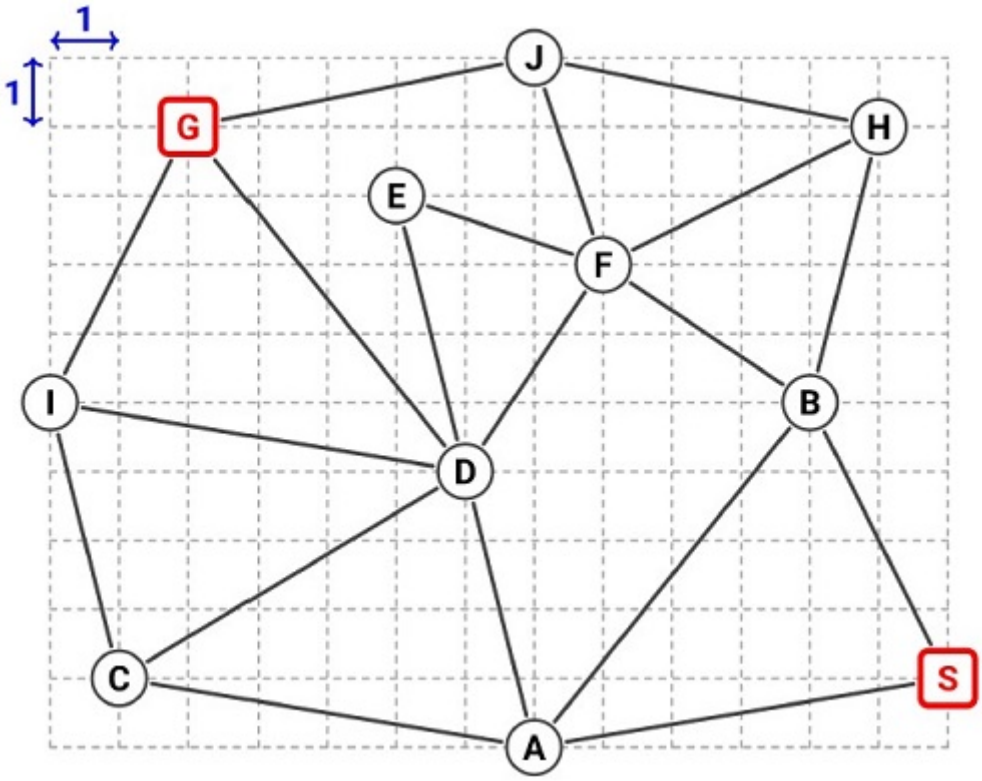
Question Label : Comprehension

SEARCH

The figure shows a map with several locations on a grid where each tile is 1x1 in size. The locations are at grid points and are connected by two-way edges.

Take S as the start node and G as the goal node. The MoveGen function returns neighbours in alphabetical order. In all the algorithms below, the RemoveSeen procedure will remove nodes from the output of MoveGen if those nodes are present in OPEN/CLOSED lists.

Use Manhattan distance when needed.



When we say a node is inspected/expanded/refined it means: the node is picked up from OPEN, and goal test is called, if goal test fails then MoveGen is called and, depending on the algorithm, the neighbours are selectively placed in OPEN.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 24 Question Id : 640653676790 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

List the first 4 nodes (including the start node) inspected by Depth First Search. List the nodes in the order they were inspected. If the algorithm terminates early then list the nodes inspected up until termination.

Enter a comma separated list of node labels.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer Format: S,X,Y,Z

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

S,A,C,I

Question Number : 25 Question Id : 640653676791 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

What is the path found by Depth First Search?

Enter the path as a comma separated list of node labels.

Enter NIL if no path is found.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer Format: S,X,Y,G

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

S,A,C,I,G

Question Number : 26 Question Id : 640653676792 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

List the first 4 nodes inspected by Breadth First Search. List the nodes in the order they were inspected. If the algorithm terminates early then list the nodes inspected up until termination.

Enter a comma separated list of node labels.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer Format: S,X,Y,Z

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

S,A,B,C

Question Number : 27 Question Id : 640653676793 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 path found by Breadth First Search?

Enter the path as a comma separated list of node labels.

Enter NIL if no path is found.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer Format: S,X,Y,G

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

S,A,D,G

Question Number : 28 Question Id : 640653676794 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

List the first 4 nodes inspected by Best First Search. List the nodes in the order they were inspected. If the algorithm terminates early then list the nodes inspected up until termination.

Enter a comma separated list of node labels.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer Format: S,X,Y,Z

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

S,B,F,E

Question Number : 29 Question Id : 640653676795 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 path found by Best First Search?

Enter the path as a comma separated list of node labels.

Enter NIL if no path is found.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer Format: S,X,Y,G

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

S,B,F,J,G

Question Number : 30 Question Id : 640653676796 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

List the first 4 nodes inspected by Hill Climbing. List the nodes in the order they were inspected. If the algorithm terminates early then list the nodes inspected up until termination.

Enter a comma separated list of node labels.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer Format: S,X,Y,Z

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

S,B,F,E

Question Number : 31 Question Id : 640653676797 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

What is the path found by Hill Climbing?

Enter the path as a comma separated list of node labels.

Enter NIL if no path is found.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer Format: S,X,Y,G

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

Nil

Sub-Section Number :	4
Sub-Section Id :	64065396825
Question Shuffling Allowed :	No
Is Section Default? :	null

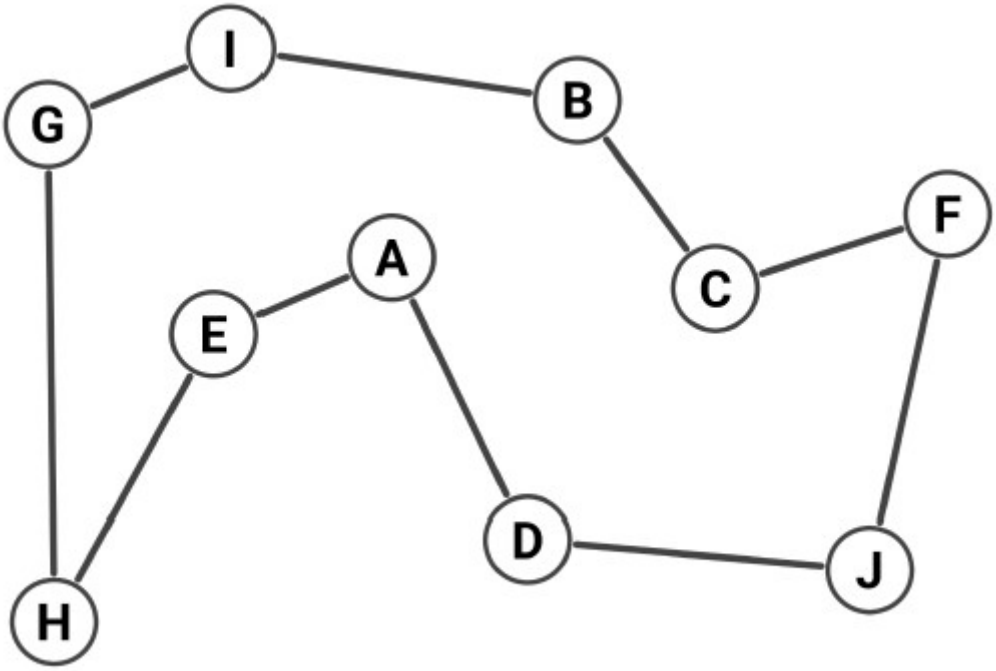
Question Id : 640653676798 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (32 to 35)

Question Label : Comprehension

Genetic Algorithm

A tour of 10 cities is shown below. The edges are bi-directional. Use A,B,C,...,H,I,J as the reference (index) sequence to prepare tour representations.



Based on the above data, answer the given subquestions.

Sub questions

Question Number : 32 Question Id : 640653676799 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select all valid path representations of the tour.

Options :

6406532266576. ✖ B,I,G,H,E,A,D,J,F,C,B

6406532266577. ✖ A,D,J,F,C,B,I,G,H,E,A

6406532266578. ✔ B,I,G,H,E,A,D,J,F,C

6406532266579. ✔ A,D,J,F,C,B,I,G,H,E

Question Number : 33 Question Id : 640653676800 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select all valid adjacency representations of the tour.

Options :

6406532266580. ✔ D,I,B,J,A,C,H,E,G,F

6406532266581. ✔ E,C,F,A,H,J,I,G,B,D

6406532266582. ✖ E,I,B,J,D,C,H,A,G,F

6406532266583. ✖ H,C,F,E,A,J,I,G,B,D

Question Number : 34 Question Id : 640653676801 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

Convert the path representation G,E,H,D,J,F,B,I,C,A to ordinal representation.

Options :

6406532266584. ✔ 7,5,6,4,6,4,2,3,2,1

6406532266585. ✖ 2,8,6,6,4,1,2,3,2,1

6406532266586. ✖ 2,8,6,6,1,3,2,3,2,1

6406532266587. ✖ 1,6,6,4,4,4,4,2,1,1

Question Number : 35 Question Id : 640653676802 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

Two tours in path representation are given below. Generate offspring using Partially Mapped Crossover (PMX), use the locations from 4 to 7 (both inclusive) as the mapping segment. Enter any one of the two child tours in the textbox.

P1: B,I,G,H,E,A,D,J,F,C

P2: G,E,H,D,J,F,B,I,C,A

Enter a comma separated list of cities.

DO NOT ENTER SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS.

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Set

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

G,J,B,H,E,A,D,I,C,F

H,I,G,D,J,F,B,E,A,C

Sub-Section Number :	5
Sub-Section Id :	64065396826
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653676803 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 : (36 to 40)

Question Label : Comprehension

TSP

The distance matrix for 5 cities and the corresponding edge costs (in sorted order) are provided below. Use this information to construct TSP tours.

	A	B	C	D	E
A	-	23	21	10	42
B	23	-	86	35	80
C	21	86	-	24	64
D	10	35	24	-	45
E	42	80	64	45	-

AD	AC	AB	CD	BD
10	21	23	24	35

AE	DE	CE	BE	BC
42	45	64	80	86

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 36 Question Id : 640653676804 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

Use B as the starting city, construct a tour using Nearest Neighbour Heuristic. The tour is _____ . Enter the path representation of the tour, start from B and trace the cities selected by the Nearest Neighbour Heuristic.

Enter a comma separated list of city names.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer format: B,X,Y,Z

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

B,A,D,C,E

Question Number : 37 Question Id : 640653676805 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

What is the cost of the tour generated by Nearest Neighbour Heuristic?

Enter a number.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer format: 17

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

201

Question Number : 38 Question Id : 640653676806 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

Construct a tour using Greedy Heuristic. Enter the path representation of the tour starting from

city B.

Enter a comma separated list of city names.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer format: B,X,Y,Z

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Set

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

B,D,A,C,E

B,E,C,A,D

Question Number : 39 Question Id : 640653676807 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

What is the cost of the tour generated by Greedy Heuristic?

Enter a number.

NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.

Answer format: 17

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

210

Question Number : 40 Question Id : 640653676808 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

Construct the savings tour using B as the base city. The savings for including the pairs of cities AC, AD and AE are 88, 48 and 61, respectively. Compute the savings for the remaining three pairs of cities, and use them to simulate the algorithm. Enter the path representation of the tour starting from city B.

Enter a comma separated list of city names.
NO SPACES, TABS, DOTS, BRACKETS, PARENTHESIS OR UNWANTED CHARACTERS.
Answer format: B,X,Y,Z

Response Type : Alphanumeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Set

Answers Case Sensitive : No

Text Areas : PlainText

Possible Answers :

B,A,E,C,D

B,D,C,E,A

Deep Learning

Section Id :	64065345315
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	7