Exam : **End Term Quiz**

Subject : **AI**

Total Marks : **25.00**

QP : **2023 Sep03: IIT M DEGREE ET1 EXAM QPE2**

Exam Mode	Learning Mode

✨ **View Question Paper Summary**

QUESTION MENU

1	2	3	4	5	6	7	8	9
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TIMER

00:08 ▶ ↻

CONTROLS

✓✓ **SUBMIT EXAM**

Your Score

0.00 / 25.00

(0%)

Question 1 : 640653614388

Total Mark : 0.00 | Type : MCQ

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 :

○ YES

○ NO

Your score : 0
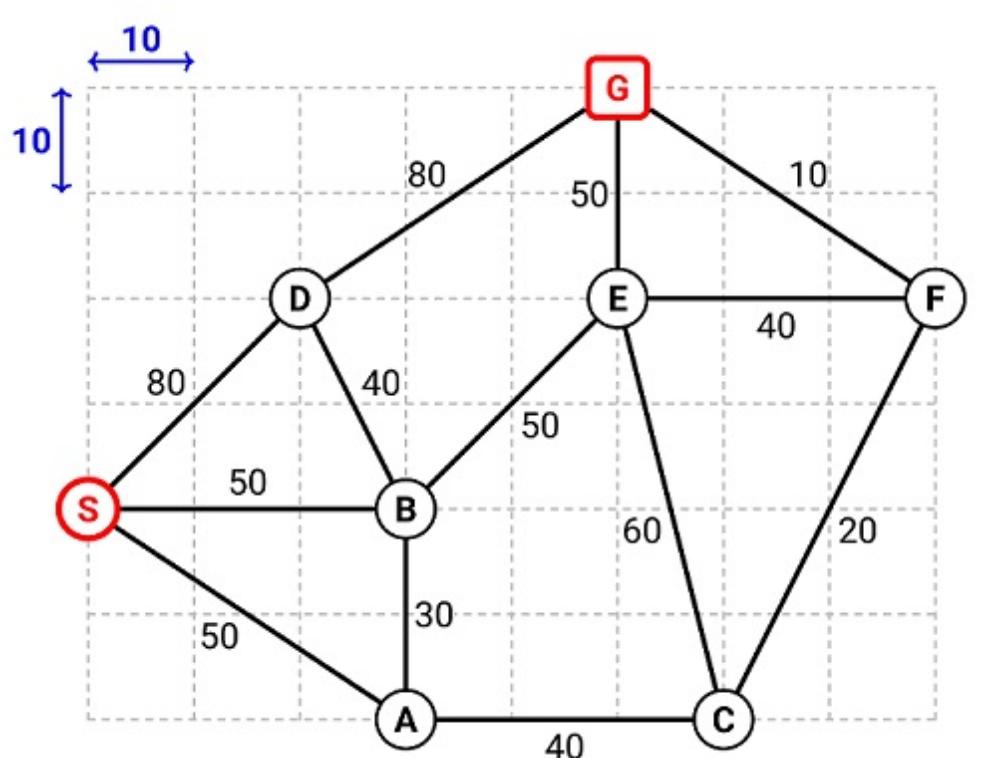
📰 Discussions (0)　　　🏳

Question 2 : 640653614389　　　　　　　　Total Mark : 0.00 | Type : COMPREHENSION

SEARCH The figure shows a map on a uniform grid where each tile is 10x10 in size. The start node is S and the goal node is G. The MoveGen function returns nodes in alphabetical order. Use Manhattan Distance as the heuristic function. Tie-breaker: If several nodes have the same cost, use node labels to break the tie. Based on the above data, answer the given subquestions.

Your score : 0

Question 3 :
640653614390

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the path found by the Depth First Search algorithm? Enter the path as a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,A,C,E,G

Your score : 0

Discussions (0)

Question 4 :
640653614391

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the path found by the Best First Search algorithm? Enter the path as a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,D,G

Your score : 0

Discussions (0)

Question 5 :
640653614392

View Parent QN   **View Solutions (0)**

Total Mark : 1.00 | Type : SA

What is the path found by A* search algorithm? Enter the path as a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,B,E,G

Your score : 0

💬 Discussions (0)   ⚑

Question 6 :
640653614393

View Parent QN   **View Solutions (0)**

Total Mark : 1.00 | Type : SA

What is the path found by Branch-and-Bound search algorithm? Enter the path as a comma separated list of node labels. Use the Branch-and-Bound variation that avoids cyclic expansions like S,A,S,A,S,A,... NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,A,C,F,G

Your score : 0

💬 Discussions (0)   ⚑

Question 7 :
640653614394

View Parent QN   **View Solutions (0)**

Total Mark : 1.00 | Type : MCQ

For the given map, which algorithm finds the shortest path from S to G?

OPTIONS :

◯ A* Search Algorithm

◯ Branch-and-Bound Search Algorithm

◯ None of these
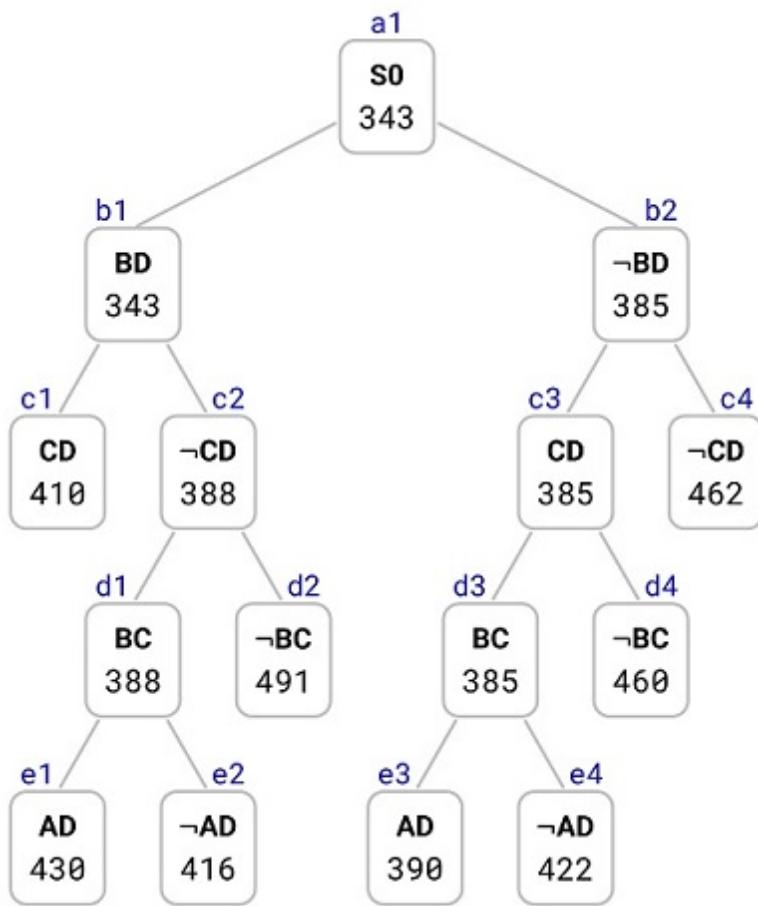
Your score : 0

💬 **Discussions (0)**   ⚑

Question 8 : 640653614395

Total Mark : 0.00 | Type : COMPREHENSION

TSP Branch-and-Bound The TSP Branch-and-Bound algorithm is solving a TSP instance where the cities are A, B, C, ... and so on. The Branch-and-Bound search tree at the time when the algorithm has discovered the optimal tour is shown below. Each node in the search tree displays an edge (either XY or ~XY), a cost value, and a unique reference number (a1, b1, b2, ..., c1, ..., d1, ..., e1, ..., e4). Use the reference numbers to breakties. When required, enter the reference numbers in short answers. What information can you glean from the search tree? Answer the sub-questions based on the information gleaned from the search tree.

Your score : 0

Question 9 :
640653614396

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : SA

Let S0 (ref. no. a1) be the first node to be refined, identify the next 4 nodes (2nd to 5th node) that are refined by the TSP Branch-and-Bound algorithm. Enter the nodes (node reference numbers) in the order they are refined. Enter a comma separated list of node reference numbers. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: a9,b9,c9,d9

Answer (Alphanumeric):

Answer

Accepted Answer : b1,b2,c3,d3

Your score : 0

💬 Discussions (0)   🏳

Question 10 :
640653614397

⬢ View Parent QN   ✓ View Solutions (0)

Total Mark : 1.00 | Type : SA

Which node represents the optimal tour and what is the cost of the optimal tour? Enter the node reference number and the tour cost in the text box, or enter NIL if it is not possible to determine the optimal tour. Enter a node reference number followed by tour cost, separated by comma. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: a9,42

Answer (Alphanumeric):

Answer

Accepted Answer : e3,390

Your score : 0

💬 Discussions (0)   🏳

Question 11 :
640653614398

⬢ View Parent QN   ✓ View Solutions (0)

Total Mark : 1.00 | Type : SA

Determine the number of cities in the TSP instance. Enter the number of cities in the text box, or enter NIL if it is not possible to determine the number of cities. Enter an integer. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 5

Your score : 0

💬 Discussions (0)   🚩

Question 12 : 640653614399

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

Start from city A, what is the path representation of the optimal tour? Enter the path representation in the text box, or enter NIL if it is not possible to determine the optimal tour. Enter a comma separated list of cities (city labels). NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: A,B,C
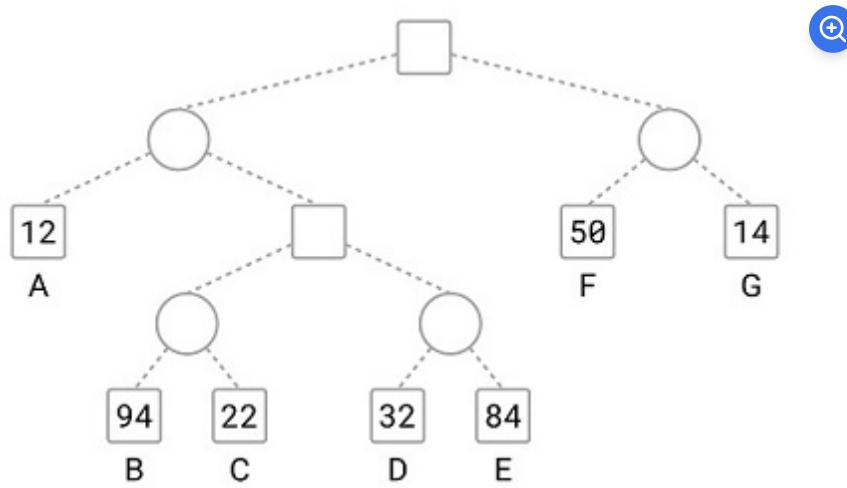
Answer (Alphanumeric):

Answer

Accepted Answer : A,D,C,B,E

Your score : 0

💬 Discussions (0)   🚩

Question 13 : 640653614400

Total Mark : 0.00 | Type : COMPREHENSION

GAMES The figure shows a game tree with evaluation function values at the horizon nodes. The horizon nodes are labeled from A to G. Use these labels to enter a horizon node or a list of horizon nodes in short answers (textbox). Tie-breaker: when several nodes carry the same best cost then select the deepest node, if tie persists then select the leftmost of the deepest nodes to break the tie. Based on the above data, answer the given subquestions.

Your score : 0

Question 14 :
640653614401

         ⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : MCQ

Which of the following is a strategy for the MAX player?

OPTIONS :

◯ A,F

◯ A,B,D,F

◯ A,D,E

◯ B,D,F

Your score : 0

💬 Discussions (0)   🚩

Question 15 :
640653614402

         ⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

List the horizon nodes in the best strategy for MAX. Enter the node labels in alphabetical order. Enter a comma separated list of node labels in alphabetical order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

[Answer]

Accepted Answer : F,G

Your score : 0

💬 **Discussions (0)**   🚩

Question 16 :
640653614403

🔷 View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

List the horizon nodes pruned by Alpha-Beta. Enter a comma separated list of node labels in alphabetical order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : D,E

Your score : 0

💬 **Discussions (0)**   🚩

Question 17 :
640653614404

🔷 View Parent QN   ⊘ View Solutions (0)
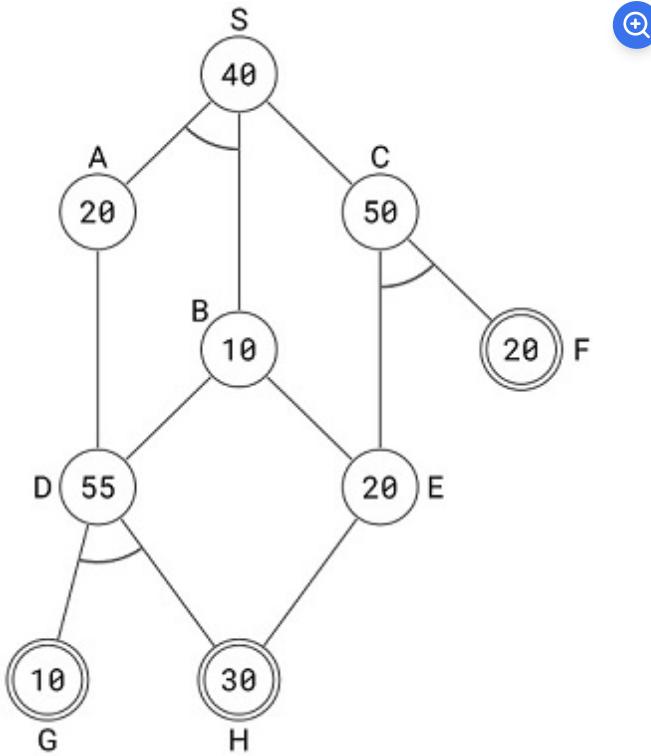
Total Mark : 1.00 | Type : SA

List the horizon nodes SOLVED by SSS*. Enter a comma separated list of node labels in alphabetical order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : A,F,G

Your score : 0

💬 **Discussions (0)**   🚩

Question 18 : 640653614405

Total Mark : 0.00 | Type : COMPREHENSION

PROBLEM DECOMPOSITION The figure shows an AND-OR graph that depicts how a problem S can be decomposed into one or more smaller problems. Nodes are uniquely identified by labels (S, A, B, …). The number in each node is the heuristic estimate of the cost of solving that node. Nodes shown in double lines are primitive nodes and their values are actual costs. Observe that a primitive node is added to the graph by its parent when the parent is expanded, and the primitive node is labeled as SOLVED and it will not be expanded subsequently. The cost of each edge is 10 units. Tie-breaker 1: If several nodes have the same cost then break the tie using node labels. Tie-breaker 2: For AND nodes, expand the unsolved branch with the highest cost. Use AO* algorithm to solve S, then answer the subquestions.

Your score : 0

Question 19 :
640653614406

[⚛ View Parent QN]   [⊘ View Solutions (0)]

Total Mark : 1.00 | Type : SA

List the first three nodes (including S) expanded by AO* algorithm. List the nodes in the order they are expanded. Observe that primitive nodes are not expanded. Enter a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : S,A,C

Your score : 0

💬 Discussions (0)   🚩

Question 20 :
640653614407

🔗 View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

Determine the value of the start node S after each node is expanded. What are the values of S after the 1st, 2nd and 3rd nodes are expanded, respectively? Enter the 3 values in the textbox. Enter a comma separated list of numbers. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 12,42,17

Answer (Alphanumeric):

Answer

Accepted Answer : 50,60,70

Your score : 0

💬 Discussions (0)   🚩

Question 21 :
640653614408

🔗 View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the final value of the start node S? Enter a number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):
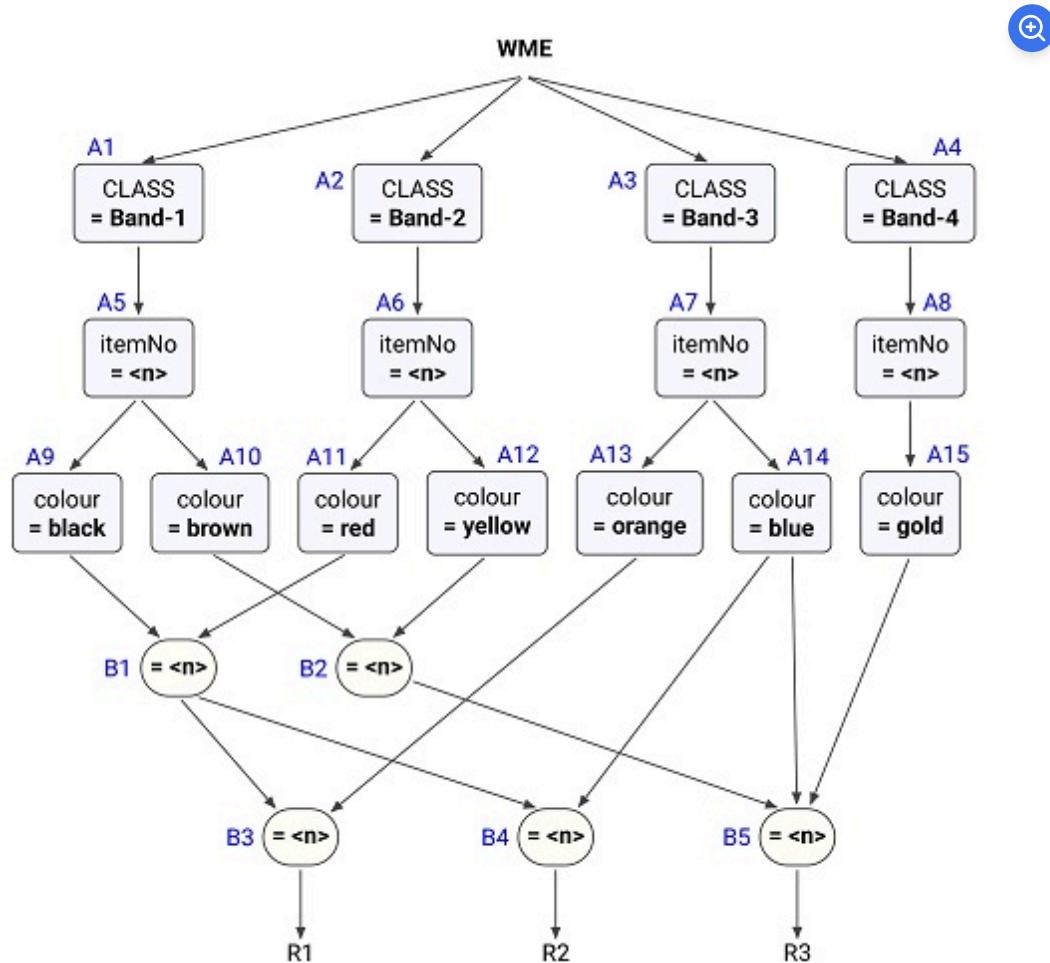
Answer

Accepted Answer : 90

💬 **Discussions (0)**   🏳

Question 22 : 640653614409   Total Mark : 0.00 | Type : COMPREHENSION

RULE BASED EXPERT SYSTEMS A small part of the Rete Net for classifying resistors is shown in the figure. The labels A1, A2, ..., A10, A11, ..., B1, ..., B5 uniquely identify the nodes in the network. When required, use the above label ordering to break ties and to enter short answers. Run the Rete algorithm for the Working Memory shown below, the WMEs are in timestamp order. Assume that WMEs reside at appropriate Alpha nodes, and the Beta nodes point to WMEs residing in Alpha nodes.

RULE BASED EXPERT SYSTEMS A small part of the Rete Net for classifying resistors is shown in the figure. The labels A1, A2, ..., A10, A11, ..., B1, ..., B5 uniquely identify the nodes in the network. When required, use the above label ordering to break ties and to enter short answers. Run the Rete algorithm for the Working Memory shown below, the WMEs are in timestamp order. Assume that WMEs reside at appropriate Alpha nodes, and the Beta nodes point to WMEs residing in Alpha nodes. For each

WME identify its location (node label) in the Rete Net, and prepare the conflict set for the first cycle, then answer the given subquestions.

```
101.  (Band-1  ^itemNo 2B  ^colour black)
102.  (Band-1  ^itemNo 3C  ^colour brown)
103.  (Band-2  ^itemNo 1A  ^colour red)
104.  (Band-2  ^itemNo 2B  ^colour yellow)
105.  (Band-2  ^itemNo 3C  ^colour yellow)
106.  (Band-3  ^itemNo 2B  ^colour blue)
107.  (Band-3  ^itemNo 3C  ^colour blue)
108.  (Band-4  ^itemNo 3C  ^colour gold)
109.  (Band-3  ^itemNo 1A  ^colour orange)
110.  (Band-1  ^itemNo 1A  ^colour black)
```

Your score : 0

Question 23 :
640653614410

⚛ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following rule-data tuples are in the conflict-set?

OPTIONS :

☐ R1,103,109,110

☐ R2,101,103,106

☐ R3,102,105,107,108

☐ R3,101,104,106,108

Your score : 0

💬 Discussions (0)   ⚑

Question 24 : 640653614411

Total Mark : 1.00 | Type : MCQ

If the Inference Engine uses Specificity as the conflict resolution strategy then identify the rule-data tuple that will be ready to fire.

OPTIONS :

○ R1,103,109,110

○ R2,101,103,106

○ R3,102,105,107,108

○ R3,101,104,106,108

Your score : 0

Discussions (0)

Question 25 : 640653614412

Total Mark : 1.00 | Type : MCQ

If the Inference Engine uses Recency as the conflict resolution strategy then identify the rule-data tuples that will be ready to fire. If multiple rule-data tuples qualify then choose one.

OPTIONS :

○ R1,103,109,110

○ R2,101,103,106

○ R3,102,105,107,108

○ R3,101,104,106,108

Your score : 0

Discussions (0)

Question 26 : 640653614413   Total Mark : 0.00 | Type : COMPREHENSION

AUTOMATED PLANNING The domain description of a Blocks World with a single one-armed robot is given below. Consider the planning problem with the following start state and goal description.

PREDICATES

```
armEmpty        The arm is not holding any block, it is empty.
holding(X)      The arm is holding X.
onTable(X)      X is on the table.
clear(X)        X has nothing above it, it is clear.
on(X,Y)         X is directly placed on Y.
```

OPERATORS

```
Pickup(X): pick up X from the table.
      Preconditions: { armEmpty, clear(X), onTable(X) }
      Add Effects  : { holding(X) }
      Del Effects  : { armEmpty, onTable(X) }


Putdown(X): place X on the table.
      Preconditions: { holding(X) }
      Add Effects  : { armEmpty, onTable(X) }
      Del Effects  : { holding(X) }


Unstack(X,Y): pick up X that is directly sitting on Y.
      Preconditions: { armEmpty, clear(X), on(X,Y) }
      Add Effects  : { clear(Y), holding(X) }
      Del Effects  : { armempty, on(X,Y) }


Stack(X,Y): place X directly on top of Y.
      Preconditions: { holding(X), clear(Y) }
      Add Effects  : { armEmpty, on(X,Y) }
      Del Effects  : { holding(X), clear(Y) }
```
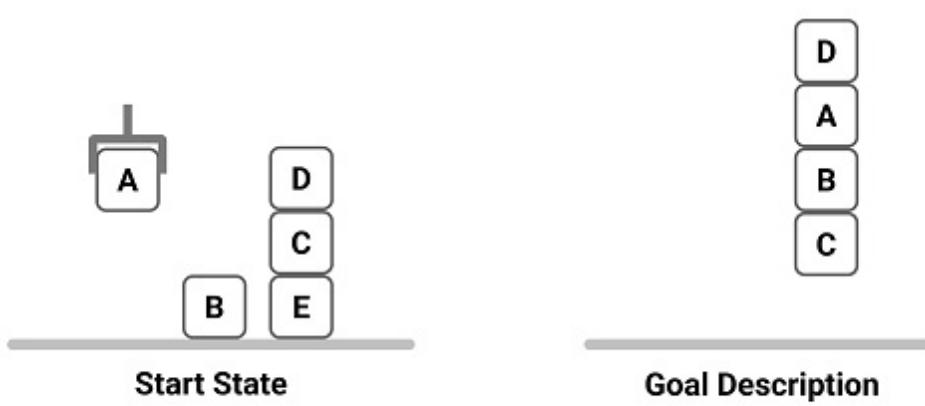
AUTOMATED PLANNING The domain description of a Blocks World with a single one-armed robot is given below. Consider the planning problem with the following start state and goal description. Based on the above data, answer the given subquestions.

Start State

{ holding(A), on(D,C), on(C,E),
  onTable(B), onTable(E),
  clear(A), clear(B), clear(D) }

Goal Description

{ on(D,A), on(A,B), on(B,C) }

Your score : 0

Question 27 :
640653614414

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following are applicable actions in the start state?

OPTIONS :

☐ Putdown(A)

☐ Stack(A,B)

☐ Stack(B,C)

☐ Stack(A,D)

☐ Stack(D,A)

Your score : 0

Discussions (0)   ⚑

Question 28 :
640653614415

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following are relevant actions in the goal state?

OPTIONS :

☐ Putdown(A)

☐ Stack(A,B)

☐ Stack(B,C)

☐ Stack(A,D)

☐ Stack(D,A)

Your score : 0

💬 Discussions (0)   🚩

Question 29 :
640653614416

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : MSQ

In the planning graph, which of the following are mutex action pairs in Layer 1?

OPTIONS :

☐ Stack(A,B), Putdown(A)

☐ Stack(A,D), Putdown(A)

☐ Stack(A,B), Stack(A,D)

☐ Pickup(B), Putdown(A)

☐ Unstack(D,C), Putdown(A)

Your score : 0

💬 Discussions (0)   🚩

Question 30 :
640653614417

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : MSQ

In the planning graph, which of the following are mutex proposition pairs in Layer 1?

OPTIONS :

☐ clear(B), holding(A)

☐ onTable(B), on(A,B)

☐ onTable(A), on(A,B)

☐ on(A,D), on(A,B)

Your score : 0

💬 Discussions (0)   ⚑
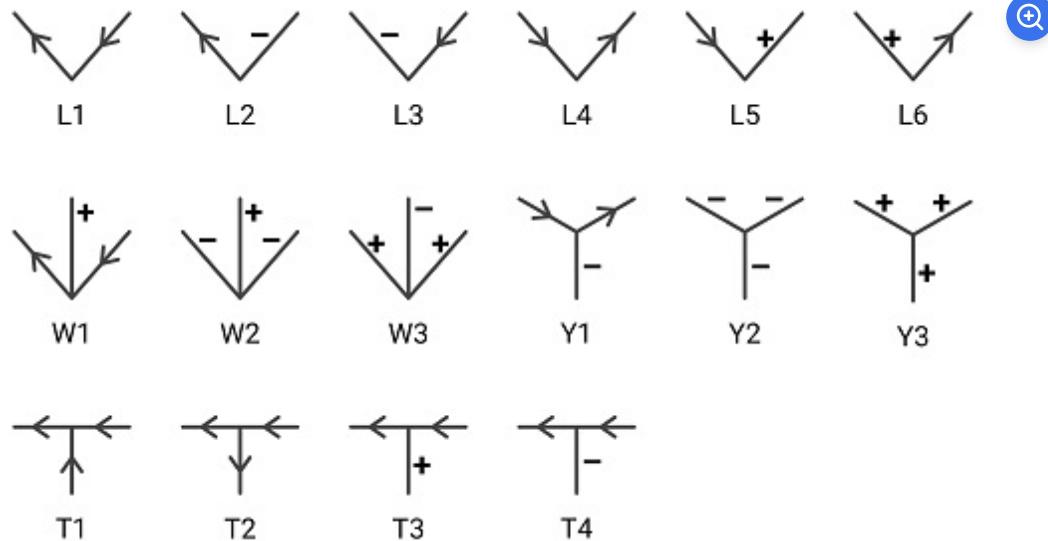
Question 31 : 640653614418   Total Mark : 0.00 | Type : COMPREHENSION

CONSTRAINT SATISFACTION The set of junctions (L, W, Y and T type junctions) that occur in a 2D line drawing of trihedral objects is provided below. The in-plane clockwise/counterclockwise rotations of these junctions are valid as well. These junctions provide constraints on the possible edge assignments (convex, concave, arrow) for the edges/lines in 2D line drawings of trihedral objects. The junctions carry unique labels: L1, L2, L3, L4, L5, L6, T1, T2, T3, T4, W1, W2, W3, Y1, Y2, Y3. When required, use the labels in short answers. Note: A 2D line drawing of trihedral objects is considered to be consistent if all the edges and junctions can be assigned labels that are consistent with each other, otherwise the drawing is considered to be inconsistent and all labels are reset to NIL. Apply a suitable algorithm to assign consistent labels to edges/junctions in the 2D line drawings in the sub-questions. Choose a suitable edge and junction order for solving the problems.


Your score : 0

Question 32 :
640653614419
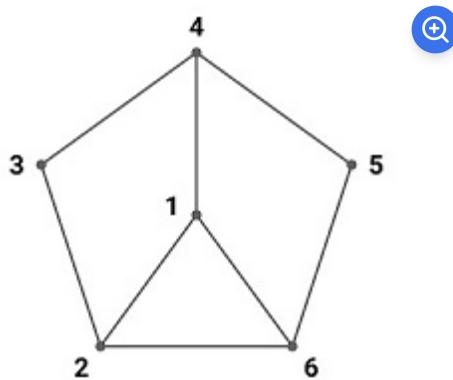
⊛ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

Assign consistent labels to all the edges and junctions in the 2D line drawing shown below. Enter the labels of the junctions 1, 2, 3, 4 in the text box, in that order. Or enter NIL if the drawing has no consistent label assignment. Enter a comma separated list of junction labels, or enter NIL. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X9,Y9,Z9,W9

Answer (Alphanumeric):

Answer

Accepted Answer : Y3,W1,L1,W1

Your score : 0

⬚ Discussions (0)   ⚑

Question 33 :
640653614420
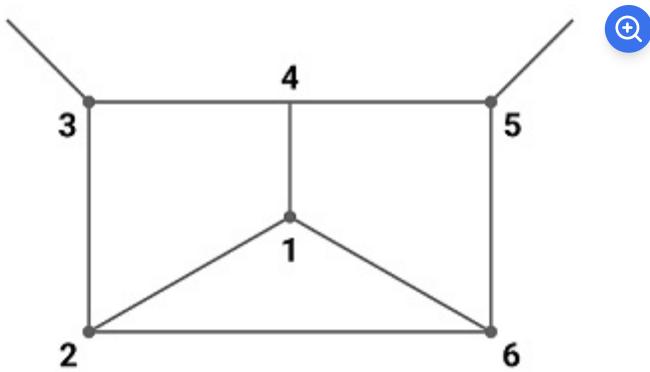
⊛ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

Assign consistent labels to all the edges and junctions in the 2D line drawing shown below. Enter the labels of the junctions 1, 2, 3, 4 in the text box, in that order. Or enter NIL if the drawing has no consistent label assignment. Enter a comma separated list of junction labels, or enter NIL. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X9,Y9,Z9,W9

Answer (Alphanumeric):

Answer

Accepted Answer : NIL

Your score : 0

Discussions (0)

✓✓ SUBMIT EXAM