Exam : End Term Quiz

Subject : AI

Total Marks : 25.00

QP : 2023 Apr30: IIT M DEGREE ET1 EXAM QPE2

Exam Mode	Learning Mode

✦ View Question Paper Summary

QUESTION MENU

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TIMER

00:07 ▶ ↻

CONTROLS

✓✓ SUBMIT EXAM

Your Score

0.00 / 25.00

(0%)

Question 1 : 640653565028   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 : 640653565029   ✓ View Solutions (0)   Total Mark : 1.00 | Type : SA

SEARCH
A MoveGen for a state space where S is the start node and G is the goal node is shown in the table. The MoveGen function returns nodes in the order as shown in the table. Use DFS and BFS to find a path from S to G. Note: DFS and BFS inspect only new nodes. What is the path found by DFS? Enter the path as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z

```
X     MoveGen(X)
---   ------------
S     [A,B]
A     [C,D,S]
B     [D,G,S]
C     [A,B,G,S]
D     [A,B]
G     [A,B,C,D]
```

Answer (Alphanumeric):

[Answer   ]

Accepted Answer : S,A,C,G
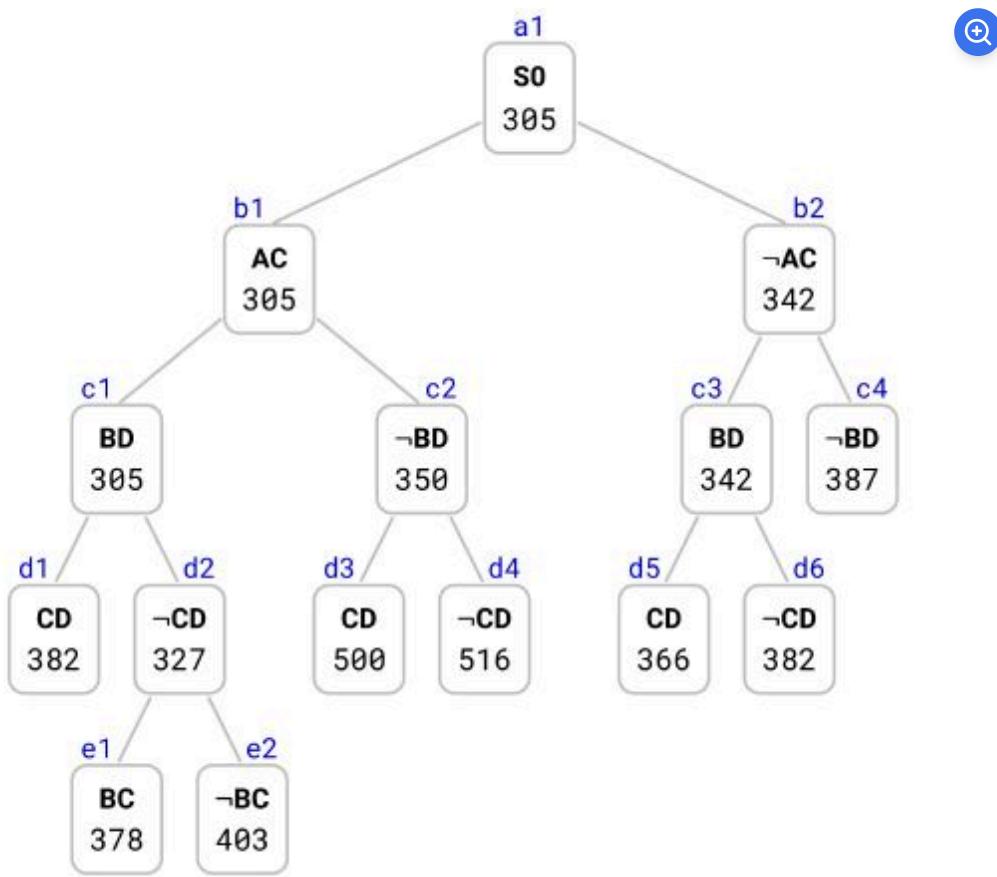
Your score : 0

💬 **Discussions (0)**   🏳

Question 3 : 640653565030   Total Mark : 0.00 | Type : COMPREHENSION

TSP BnB

TSP BnB algorithm is solving a TSP instance where the cities are A, B, C, …. and so on. The BnB search tree (at the point when the algorithm discovers the optimal tour) is provided below. Each node in the search tree displays an edge (either XY or ¬XY), a cost value, and a unique reference number (a1, b1, …, c1, …, d1, …, e1, e2). Use the reference numbers to break ties. When required, use 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 4 :
640653565031

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 5 :
640653565032

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 BnB 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,c1,d2,b2

Your score : 0

Discussions (0)

Question 6 :
640653565033

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : SA

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

Answer (Alphanumeric):

Answer

Accepted Answer : d5

Your score : 0

Discussions (0)

Question 7 :
640653565034

View Parent QN | View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the cost of the optimal tour? Enter the cost of the optimal tour in the text box, or enter NIL if it is not possible to determine the optimal tour. Enter an integer. NO SPACES, TABS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 366

Your score : 0

Discussions (0)

Question 8 :
640653565035

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,B,D,C,E

Your score : 0

💬 Discussions (0)   🚩
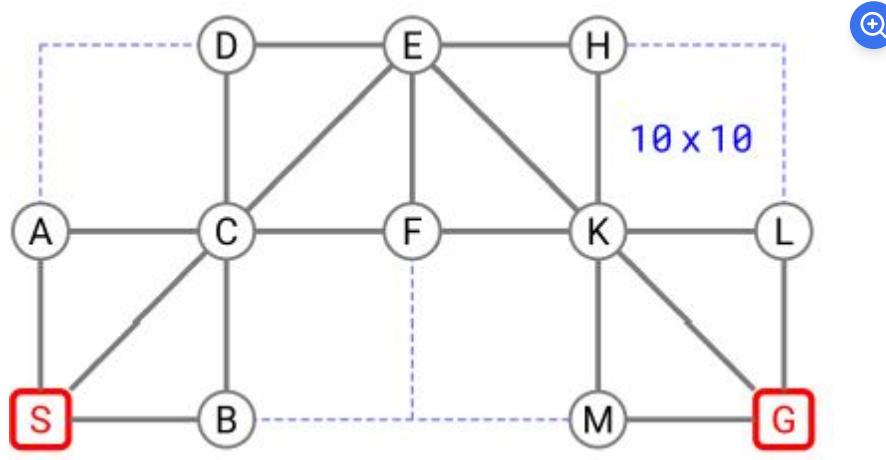
Question 9 : 640653565036   Total Mark : 0.00 | Type : COMPREHENSION

SEARCH FOR OPTIMAL SOLUTION
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 and the cost of each edge is **15 units**. The MoveGen function returns nodes in alphabetical order. Use Manhattan Distance as the heuristic function. Where necessary, use node labels to break ties. Based on the above data, answer the given subquestions.

Your score : 0

🚩

Question 10 :   🔷 View Parent QN   ⊘ View Solutions (0)
640653565037
                          Total Mark : 1.00 | Type : SA

What is the path found by A*? 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,C,F,K,G

Your score : 0

💬 Discussions (0)   ⚑

Question 11 :
640653565038

⬢ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the cost of the path found by A*? Enter an integer. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 60

Your score : 0

💬 Discussions (0)   ⚑

Question 12 :
640653565039

⬢ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : MCQ

Is the Manhattan Distance admissible for the given problem?

OPTIONS :

○ Yes

○ No

○ Cannot be determined

Your score : O

💬 Discussions (0)   🏳
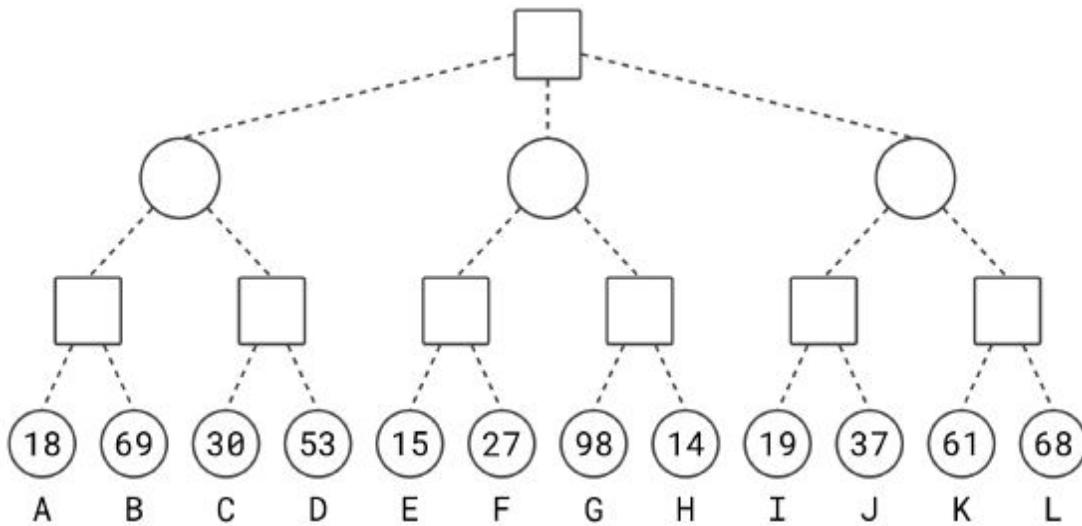

Question 13 : 640653565040   Total Mark : 0.00 | Type : COMPREHENSION

GAMES

The figure shows a 3-ply game tree with evaluation function values defined at horizon. The nodes in the horizon are labeled from A to L. Use these labels when asked to enter a horizon node or a list of horizon nodes. Tie-breaker: when several nodes qualify then select the left most node, if tie persists then select the deepest node among the left most nodes. Based on the above data, answer the given subquestions.

Your score : O

🏳

Question 14 :   ⚛ View Parent QN   ⊘ View Solutions (0)
640653565041
                                     Total Mark : 1.00 | Type : MCQ

Which of the following is a strategy for MAX?

OPTIONS :

○ A,B

○ A,B,E,F,I,J

○ F,H

○ A,E,I,K

Your score : 0

💬 Discussions (0)   🏳

Question 15 :   🔷 View Parent QN   ⊘ View Solutions (0)
640653565042
                                            Total Mark : 1.00 | Type : SA

List the horizon nodes in the best strategy for MAX. Enter the nodes in the ascending order of node labels. 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 : B,D

Your score : 0

💬 Discussions (0)   🏳

Question 16 :   🔷 View Parent QN   ⊘ View Solutions (0)
640653565043
                                            Total Mark : 1.00 | Type : SA

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

Answer (Alphanumeric):

Answer

Accepted Answer : G,H,K,L

Your score : 0

💬 Discussions (0)   🏳

Question 17 :
640653565044

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

Force the MinMax value to 98 by changing the eval of only one horizon node. Select the horizon node that you want to change and select the smallest possible value for that node. Enter the node label and the new value as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,17
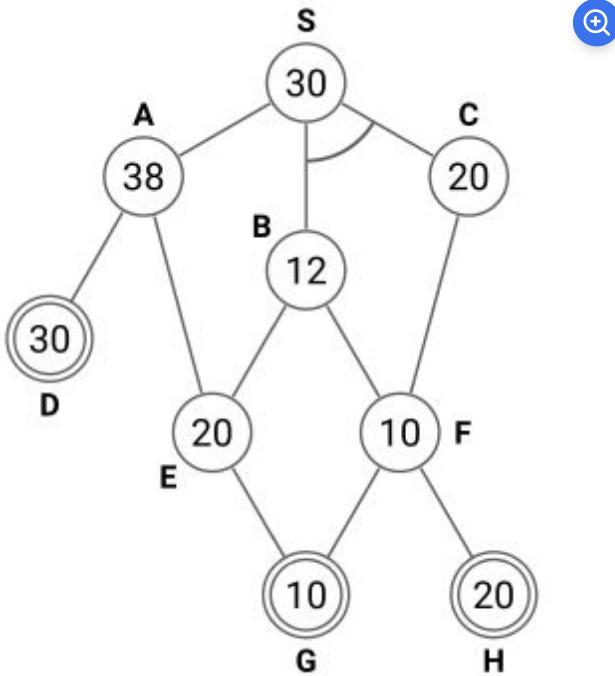
Answer (Alphanumeric):

Answer

Accepted Answer : E,98

Your score : 0

💬 Discussions (0)   🏳

Question 18 : 640653565045

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 simpler 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 2 units. Tie-breaker 1: For nodes with the same cost, expand in the ascending order of 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 given subquestions.

Your score : 0

Question 19 :
640653565046

⛥ 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,C,F

Your score : 0

💬 **Discussions (0)**   🚩

Question 20 :
640653565047

⚛ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

Determine the value of the start node S after each node expansion. Ignore the initial value of S and list the first three values of S computed from the first three node expansions. 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 : 36,28,30

Your score : 0

💬 **Discussions (0)**   🚩

Question 21 :
640653565048

⚛ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA
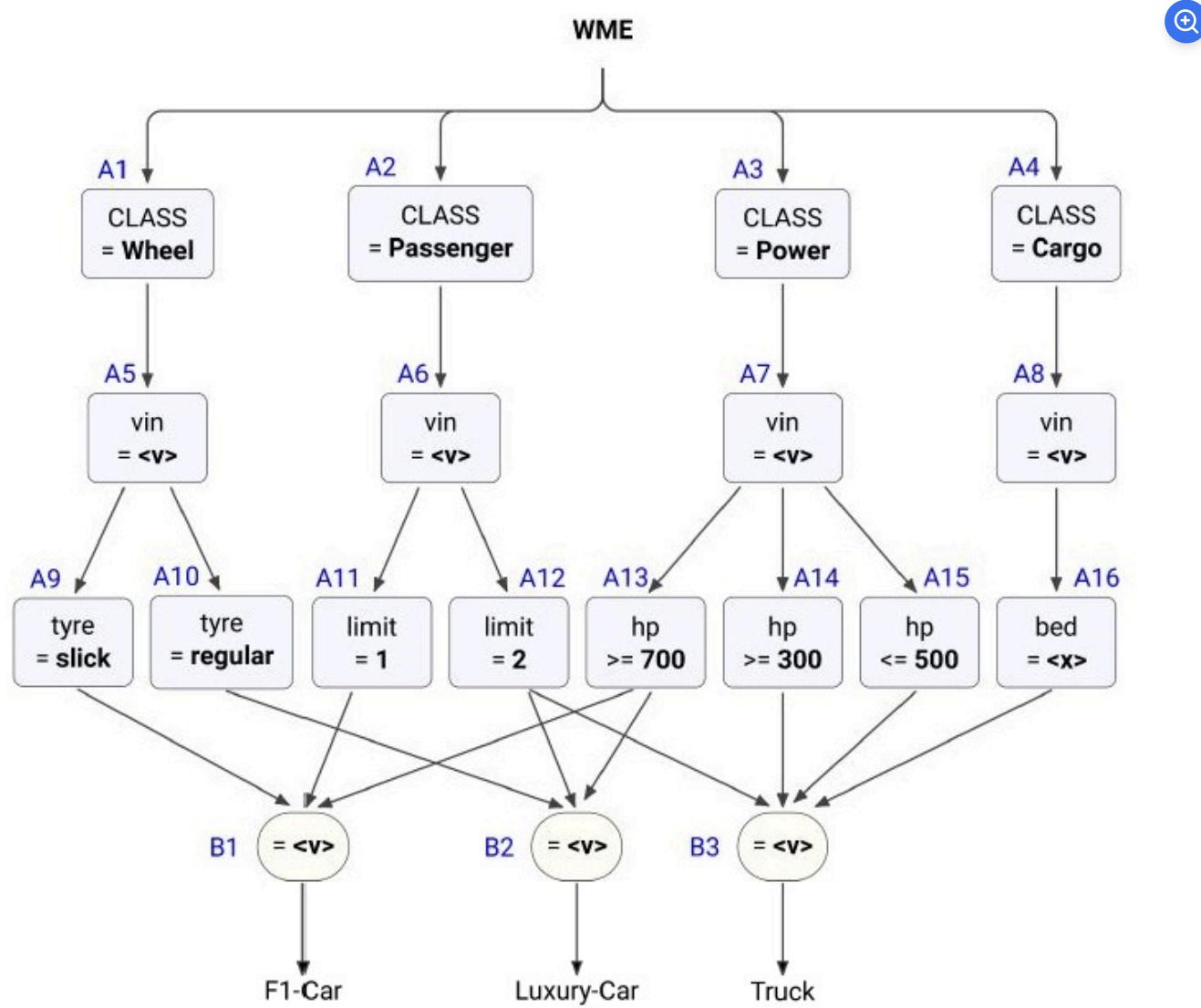
What is the final value of the start node S? Enter a number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

[Answer]

Accepted Answer : 32

Your score : 0

💬 **Discussions (0)**   🚩

Question 22 : 640653565049

Total Mark : 0.00 | Type : COMPREHENSION

RULE BASED EXPERT SYSTEMS

A Rete Net for classification of machines is shown in the figure. The labels A1, A2, A3, ..., A10, A11, A12, A13, ..., and B1, B2, B3 uniquely identify 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 Rete Net for classification of machines is shown in the figure. The labels A1, A2, A3, ..., A10, A11, A12, A13, ..., and B1, B2, B3 uniquely identify 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.  (Cargo ^vin A1 ^bed flat)
102.  (Passenger ^vin A1 ^limit 2)
103.  (Passenger ^vin B2 ^limit 2)
104.  (Passenger ^vin C3 ^limit 1)
105.  (Power ^vin A1 ^hp 400)
106.  (Power ^vin B2 ^hp 800)
107.  (Power ^vin C3 ^hp 900)
108.  (Wheel ^vin B2 ^tyre regular)
109.  (Wheel ^vin C3 ^tyre slick)
```

Your score : 0

Question 23 :
640653565050

&& 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 :

☐ F1-Car,104,107,109

☐ Luxury-Car,103,106,108

☐ Truck,101,102,105

☐ Truck,101,103,106

Your score : 0

💬 Discussions (0)   🏳

Question 24 :
640653565051

&& View Parent QN   ⊘ View Solutions (0)

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 :

○ F1-Car,104,107,109

○ Luxury-Car,103,106,108

○ Truck,101,102,105

○ Truck,101,103,106

Your score : 0

💬 Discussions (0)   🚩

Question 25 :
640653565052

⚛ View Parent QN   ⊘ View Solutions (0)

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 :

○ F1-Car,104,107,109

○ Luxury-Car,103,106,108

○ Truck,101,102,105

○ Truck,101,103,106

Your score : 0

💬 Discussions (0)   🚩

Question 26 : 640653565053

Total Mark : 0.00 | Type : COMPREHENSION

AUTOMATED PLANNING

The domain description of a Blocks World with a single one-armed robot is given below. Based on the above data, answer the given subquestions.

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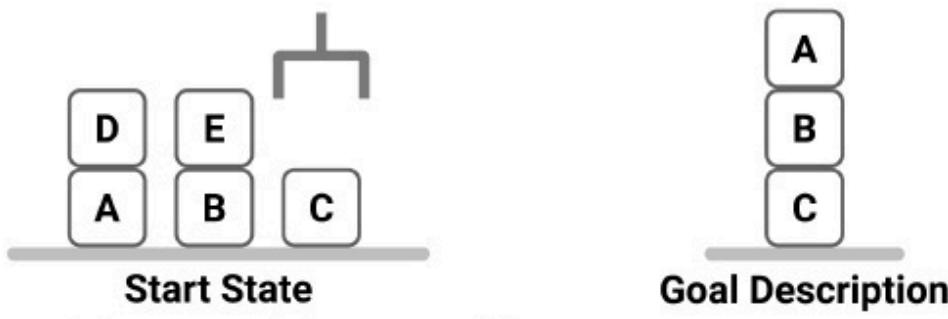
Unstack(X,Y). Pick up X that is directly sitting on Y.
      Preconditions: { armEmpty, clear(X), on(X,Y) }
      Add Effects   : { clear(Y), holding(X) }
      Del Effects   : { armempty, on(X,Y) }

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) }

Consider the following planning problem.

Start State
{ onTable(A), onTable(B), onTable(C),
  clear(D), clear(E), clear(C),

Goal Description
{ on(B,C), on(A,B) }

on(D,A), on(E,B), armEmpty }

Your score : 0

🚩

Question 27 : 640653565054

     🔷 **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(D)` 🔍

☐ `Unstack(D,A)` 🔍

☐ `Unstack(E,B)` 🔍

☐ `Pickup(C)` 🔍

☐ `Pickup(A)` 🔍

☐ `Stack(A,B)` 🔍

☐ `Stack(B,C)` 🔍

Your score : 0

💬 **Discussions (0)**   🚩

Question 28 : 640653565055

     🔷 **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(D) 🔍

☐ Unstack(D,A) 🔍

☐ Unstack(E,B) 🔍

☐ Pickup(C) 🔍

☐ Pickup(A) 🔍

☐ Stack(A,B) 🔍

☐ Stack(B,C) 🔍

Your score : 0

💬 Discussions (0)   🚩

Question 29 :
640653565056

⚛ 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 :

☐ Unstack(D,A), Pickup(C) 🔍

☐ Unstack(D,A), Unstack(E,B) 🔍

☐ Pickup(C), Stack(A,B) 🔍

☐ Pickup(C), Stack(B,C) 🔍

Your score : 0

💬 Discussions (0)   🚩

Question 30 : 640653565057

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(A), holding(E)` 🔍
- ☐ `clear(A), clear(B)` 🔍
- ☐ `clear(C), on(D,A)` 🔍
- ☐ `clear(C), holding(E)` 🔍
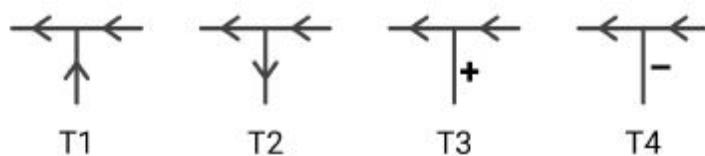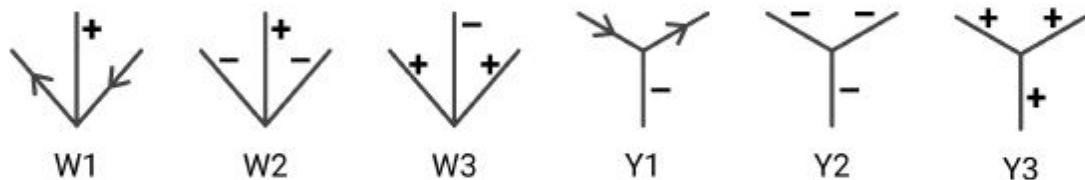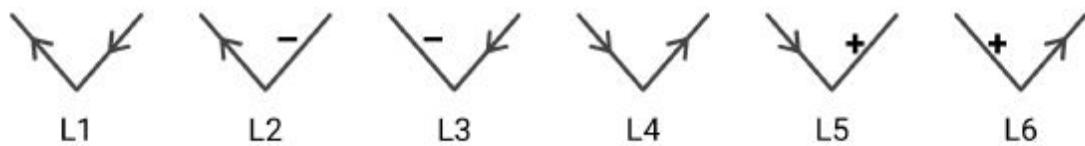
Your score : 0

Discussions (0)   🏳

Question 31 : 640653565058

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. Apply a suitable algorithm to assign labels to edges/junctions in the 2D line drawings given in the sub-questions, process the edges and junctions in any order you see fit. Note: A 2D line drawing of trihedral objects is valid if and only if all the edges and junctions in the drawing are assigned consistent labels, otherwise the drawing is inconsistent and all labels are reset to NIL. Based on the above data, answer the given subquestions.

L1   L2   L3   L4   L5   L6

W1   W2   W3   Y1   Y2   Y3

T1   T2   T3   T4

Your score : 0

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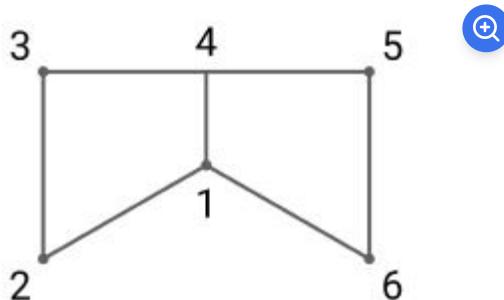
Question 32 :
640653565059

⟐ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

For the 2D line drawing, assign consistent labels to all edges and junctions. 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,L5,L4,T3

Your score : 0

Discussions (0)
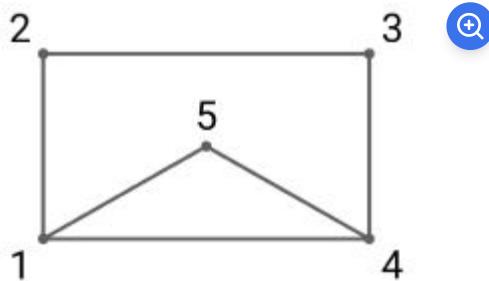
Question 33 :
640653565060

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : SA

For the 2D line drawing, assign consistent labels to all edges and junctions. 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**