Exam : **Quiz 2**

Subject : **AI**

Total Marks : **25.00**

QP : **2022 Nov: IIT M DEGREE AN2 EXAM QPE1**

Exam Mode	Learning Mode

✦ View Question Paper Summary

QUESTION MENU

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31					

TIMER

00:09 ▶ ↻

CONTROLS

✓✓ SUBMIT EXAM

Your Score

0.00 / 25.00

(0%)

Question 1 : 640653446478   Total Mark : 0.00 | Type : MCQ

THIS IS QUESTION PAPER FOR THE SUBJECT "DEGREE LEVEL : AI:SEARCH METHODS FOR PROBLEM SOLVING"

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

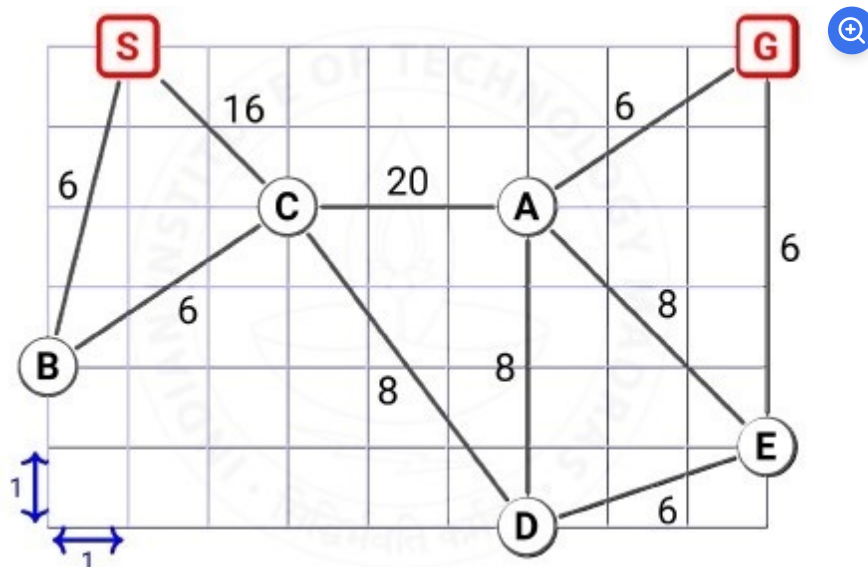💬 Discussions (0)   🏳

Question 2 : 640653446479   Total Mark : 0.00 | Type : 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 (roads), where each edge has a cost that is the same in both directions. Observe that the edge costs are not necessarily proportional to the coordinate based distance estimates. The start node is S and the goal node is G, the MoveGen function returns neighbours in alphabetical order. Use Manhattan distance as the heuristic function. Tie-breaker: when several nodes have the same best cost, use alphabetical order to break ties. Emulate A*, WA* and Branch-and-Bound on the given map, then answer the given subquestions.

Your score : 0

🏳

Question 3 :

640653446480

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

Total Mark : 1.00 | Type : SA

In the map, S is the first node to be refined, determine the next 4 nodes from the 2nd to 5th node refined by A*. Enter the nodes in the order they are refined. Enter a comma separated list of node labels. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: W,X,Y,Z

Answer (Alphanumeric):

[Answer]

Accepted Answer : B,C,D,E

Your score : 0

💬 **Discussions (0)**   🏳

Question 4 :

640653446481

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

Total Mark : 1.00 | Type : SA

For the 4 nodes listed in the **previous question**, list the f-values of those nodes as a comma separated list. Use the same node order used in the previous question. Enter a comma separated list of natural numbers. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 2,7,1,8

Answer (Alphanumeric):

[Answer]

Accepted Answer : 19,20,29,31

Your score : 0

💬 **Discussions (0)**　　　⚑

Question 5 :
640653446482

⊛ View Parent QN　　⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

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

Answer (Alphanumeric):

Answer

Accepted Answer : S,B,C,D,E,G

Your score : 0

💬 **Discussions (0)**　　　⚑

Question 6 :
640653446483

⊛ View Parent QN　　⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

A* may revise the f-values of nodes when it visits them again. List all the f-values assigned to node 'A', excluding +INFINITY (or +LARGE) assigned initially. Enter a comma separated list of f-values. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 3,1,4

Answer (Alphanumeric):

Answer

Accepted Answer : 37,33

Your score : 0

💬 **Discussions (0)**　　　⚑

Question 7 :
640653446484

Total Mark : 1.00 | Type : SA

For w=3, what is the path found by WA* algorithm? Enter the path as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: S,X,Y,Z,G

Answer (Alphanumeric):

Answer

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

Your score : 0

Discussions (0)

Question 8 :
640653446485

Total Mark : 1.00 | Type : SA

What is the cost of the path found by Branch-and-Bound algorithm? Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 32

Your score : 0

Discussions (0)

Question 9 :
640653446486

Total Mark : 1.00 | Type : MCQ

Is the heuristic admissible in the given map?

OPTIONS :

○ Yes

○ No

○ Cannot be determined

Your score : 0

⊡ Discussions (0)   ⚑

Question 10 : 640653446501   Total Mark : 0.00 | Type : COMPREHENSION

AUTOMATED PLANNING
The domain description of a blocks-world with a single one-armed robot is provided below. Note: this is the same domain description used in the weekly assignments. Tie-breaker for subgoal ordering: treat the start state, goal description, preconditions and effects as lists that are accessed from left to right. When the elements in a list are pushed one by one into a stack, the last element will be at the top of the stack. It has the effect of reversing the list. Tie-breaker for block placement: when there are multiple locations for placing a block, choose the location that satisfies a goal at hand, or else, choose a location that will lead to a better plan, or else, place it on the table. Tie-breaker for action selection: when actions are chosen non-deterministically, choose actions that lead to a plan, even a suboptimal plan is fine. Throwaway the actions that may lead to deadends and loops. A planning problem is given below, find a plan using the operators and predicates defined in the blocks-world domain

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.
Pickup(X)	Pickup X from the table.
Putdown(X)	Putdown X on the table.
Unstack(X,Y)	Remove X that is directly sitting on Y.
Stack(X,Y)	Place X directly on top of Y.

OPERATORS

```
Pickup(X)
    Preconditions: { armEmpty, clear(X), onTable(X) }
    Add Effects  : { holding(X) }
    Del Effects  : { armEmpty, onTable(X) }

Putdown(X)
    Preconditions: { holding(X) }
    Add Effects  : { armEmpty, onTable(X) }
    Del Effects  : { holding(X) }


Unstack(X,Y)
    Preconditions: { armEmpty, clear(X), on(X,Y) }
    Add Effects  : { clear(Y), holding(X) }
    Del Effects  : { armempty, on(X,Y) }

Stack(X,Y)
    Preconditions: { holding(X), clear(Y) }
    Add Effects  : { armEmpty, on(X,Y) }
    Del Effects  : { holding(X), clear(Y) }
```
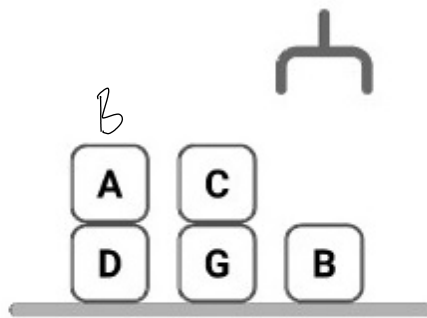
AUTOMATED PLANNING

The domain description of a blocks-world with a single one-armed robot is provided below. Note: this is the same domain description used in the weekly assignments. Tie-breaker for subgoal ordering: treat the start state, goal description, preconditions and effects as lists that are accessed from left to right. When the elements in a list are pushed one by one into a stack, the last element will be at the top of the stack. It has the effect of reversing the list. Tie-breaker for block placement: when there are multiple locations for placing a block, choose the location that satisfies a goal at hand, or else, choose a location that will lead to a better plan, or else, place it on the table. Tie-breaker for action selection: when actions are chosen non-deterministically, choose actions that lead to a plan, even a suboptimal plan is fine.

Throwaway the actions that may lead to deadends and loops. A planning problem is given below, find a plan using the operators and predicates defined in the blocks-world domain Based on the above data, answer the given subquestions.

unstack(C,G),
putdown(C)
unstack(A,D)
stack(A,G)
pickup(B),
stack(B,A)

Start State

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

Goal Description

{ on(A,G), on(B,A) }

on(B,A); on(A,G); { on(A,G), on(B,A) }; END

Your score : 0

Question 11 :
640653446502

     View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the length of the optimal plan? Enter the number of actions in the optimal plan. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 6

Your score : 0

     Discussions (0)

Question 12 :
640653446503

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following are **applicable** actions for the given planning problem?

OPTIONS :

☐ Pickup(A)

☐ Pickup(B)

☐ Pickup(C)

☐ Unstack(A,D)

☐ Unstack(C,G)

Your score : 0

💬 Discussions (0)   ⚑

Question 13 :
640653446504

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : MSQ

Which of the following are **relevant** actions for the given planning problem?

OPTIONS :

☐ Pickup(B)

☐ Putdown(B)

☐ Stack(A,G)

☐ Stack(B,A)

☐ Unstack(A,D)

☐ Unstack(C,G)

Your score : 0

💬 Discussions (0)   ⚑

Question 14 :
640653446505

⬡ View Parent QN   ✓ View Solutions (0)

Total Mark : 1.00 | Type : MCQ

Which of the following can be pushed as the first three elements onto the stack by the Goal Stack Planning algorithm? In the representation below the stack has a bottom on the right marked by the entry END. Use appropriate tie-breakers listed in main question.

OPTIONS :

○ { on(A,G), on(B,A) }; on(A,G); on(B,A); END

○ { on(A,G), on(B,A) }; on(B,A); on(A,G); END

○ on(B,A); on(A,G); { on(A,G), on(B,A) }; END

○ on(A,G); on(B,A); { on(A,G), on(B,A) }; END

Your score : 0

💬 Discussions (0)   🚩

Question 15 :
640653446506

⬡ View Parent QN   ✓ View Solutions (0)

Total Mark : 1.00 | Type : MCQ

For the subgoal ordering given in the goal description (and using the given tie breaking rules), which of the following is the first action popped out of the stack in Goal Stack Planning?

OPTIONS :

○ Pickup(B)

○ Stack(B,A)

○ Unstack(A,D)

○ Unstack(C,G)

Your score : 0

💬 **Discussions (0)**   🏳

Question 16 :
640653446507

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

Total Mark : 1.00 | Type : MCQ

For the subgoal ordering given in the goal description (and using the given tie breaking rules), does the Goal Stack Planning algorithm find an optimal plan?

OPTIONS :

◯ Yes

◯ No

◯ Cannot be determined

Your score : 0

💬 **Discussions (0)**   🏳

Question 17 :
640653446508

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

Total Mark : 1.00 | Type : MCQ

If the subgoals in the goal description are swapped places then does the Goal Stack Planning algorithm find an optimal plan?

OPTIONS :

◯ Yes

◯ No

◯ Cannot be determined

Your score : 0

💬 **Discussions (0)**   🏳

Question 18 : 640653446487   Total Mark : 0.00 | Type : COMPREHENSION
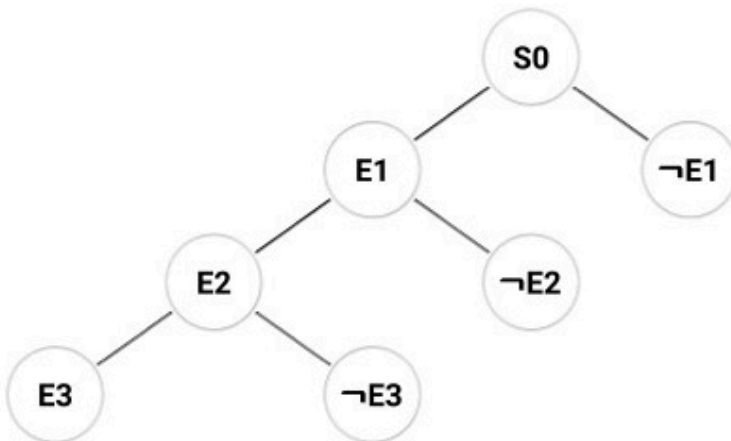
TSP

The distance matrix and edge costs for 5 cities (A to E) are provided below along with the BnB search tree. Use the Branch-and-Bound algorithm to compute the optimal tour. Attention: since we are solving problems by hand, infer as much as possible (and as early as possible) about the permanent edges in the partial solution. Based on the above data, answer the given subquestions.

	A	B	C	D	E
A	-	70	40	72	42
B	70	-	30	32	68
C	40	30	-	36	44
D	72	32	36	-	50
E	42	68	44	50	-

BC	BD	CD	AC	AE
30	32	36	40	42

CE	DE	BE	AB	AD
44	50	68	70	72

Your score : 0

Question 19 :   [View Parent QN]   [View Solutions (0)]
640653446488
                                       Total Mark : 1.00 | Type : SA

What is the lower bound on the cost of the tour as per the TSP BnB algorithm discussed in class? Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):

Answer

Accepted Answer : 182

Your score : 0

💬 Discussions (0)   🚩

Question 20 :
640653446489

🔗 View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the first edge E1 (XY) used for refining S0? Enter edge label XY NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: XY

Answer (Alphanumeric):

Answer

Accepted Answer : BC

Your score : 0

💬 Discussions (0)   🚩

Question 21 :
640653446490

🔗 View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the cost of the node ~E1 that excludes edge XY? Enter a natural number. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 42

Answer (Numeric):

Answer

Accepted Answer : 207

Your score : 0

💬 **Discussions (0)**   🚩

Question 22 :
640653446491

🔷 View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the second edge E2 (XY) that is used for refinement? What is the cost of the node E2. Enter the edge XY and the cost as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: XY,42

Answer (Alphanumeric):

[Answer   ]

Accepted Answer : BD,191

Your score : 0

💬 **Discussions (0)**   🚩

Question 23 :
640653446492

🔷 View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the cost of the optimal tour? NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: 17

Answer (Numeric):
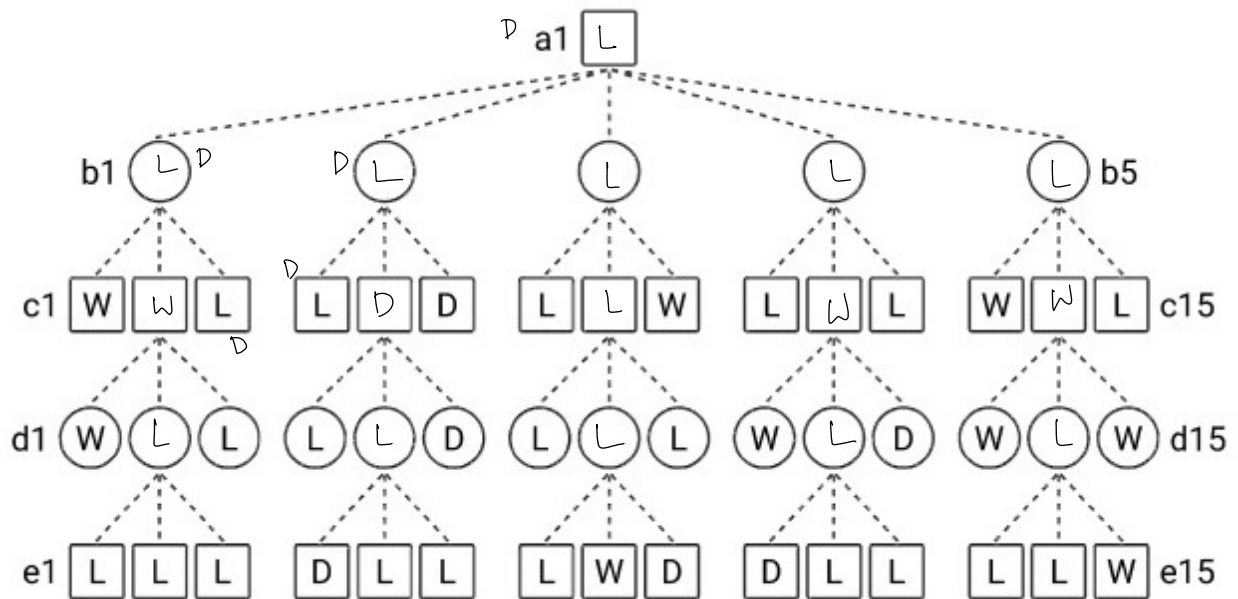
[Answer   ]

Accepted Answer : 194

Your score : 0

💬 **Discussions (0)**   🚩

Question 24 : 640653446493   Total Mark : 0.00 | Type : COMPREHENSION

GAMES

The figure shows a game tree with evaluations W (win), L (loss) and D (draw) from Max's perspective. The nodes are labeled in a level-by-level (a,b,…,e) left-to-right (1,2,…) manner as indicated in the game tree. Based on the above data, answer the given subquestions.

C3, D
C4, D

Your score : 0

Question 25 :

640653446494

	View Parent QN		View Solutions (0)

Total Mark : 1.00 | Type : SA

What is the outcome (W, D or L) of the game when both players play perfectly? NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X

Answer (Alphanumeric):

Answer

Accepted Answer : L

Your score : 0

💬 Discussions (0)   🏳

Question 26 : 640653446495

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

You are allowed to change the eval of one leaf node, change the eval such that the game will end in a draw when both players play perfectly. Which node will you change and what is the new eval? Enter the label of the node you wish to change and the new eval as a comma separated list. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: a1,X

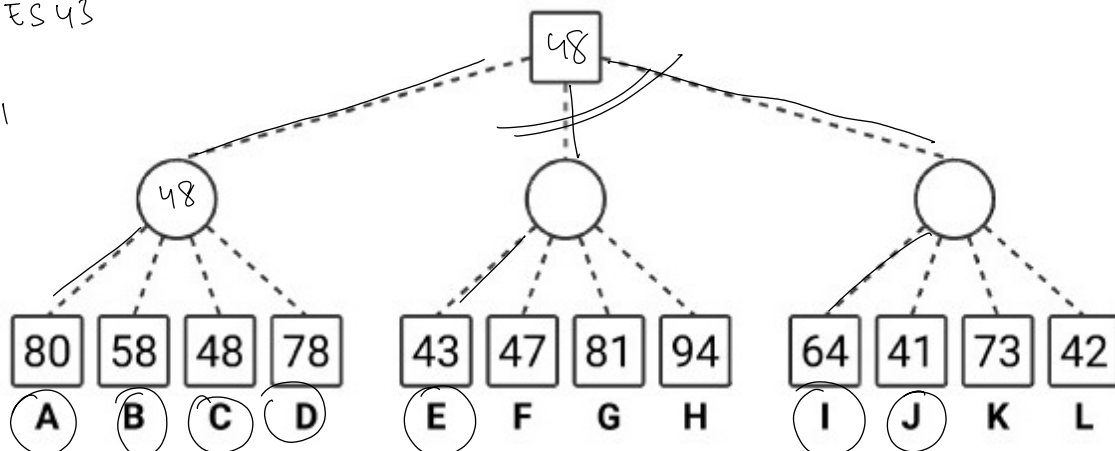Answer (Alphanumeric):

Answer

Accepted Answer : c3,D

Your score : 0

💬 Discussions (0)   🏳

Question 27 : 640653446496

Total Mark : 0.00 | Type : COMPREHENSION

Based on the above data, answer the given subquestions.

Your score : 0

Question 28 :
640653446497

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : SA

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

Answer (Alphanumeric):

Answer

Accepted Answer : A,B,C,D

Your score : 0

Discussions (0)

Question 29 :
640653446498

View Parent QN   View Solutions (0)

Total Mark : 1.00 | Type : SA

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

Answer (Alphanumeric):

Answer

Accepted Answer : F,G,H,K,L

Your score : 0

Discussions (0)

Question 30 :
640653446499

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

List the horizon nodes in the initial cluster formed by SSS* algorithm. Enter the node labels as a comma separated list in ASCENDING order. NO SPACES, TABS, DOTS, BRACKETS OR EXTRANEOUS CHARACTERS. Answer format: X,Y,Z

Answer (Alphanumeric):

Answer

Accepted Answer : A,E,I

Your score : 0

💬 Discussions (0)   🏴

Question 31 :
640653446500

⬡ View Parent QN   ⊘ View Solutions (0)

Total Mark : 1.00 | Type : SA

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

Answer (Alphanumeric):

Answer

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

Your score : 0

💬 Discussions (0)   🏴

✓✓ SUBMIT EXAM