

1. What does the following statement refer to?

While a machine may act in a manner that appears to be intelligent, since the symbols it processes are meaningless to the machine, it cannot be really intelligent.

- a) Turing Test
- b) Searle's Argument
- c) The Physical Symbol System Hypothesis
- d) Strong AI
- e) Total Turing Test

2. What is true about Weak AI?

- a) Weak AI is the simulation of intelligence
- b) Weak AI is the duplication of intelligence
- c) Weak AI aims to understand intelligence
- d) Options a) and c)
- e) None of the above

3. What abilities does a computer require in order to pass the standard Turing test?

- a) Language, manipulation of objects, reasoning
- b) Language, reasoning, learning
- c) Vision, language, learning
- d) All of the above
- e) None of the above

4. Which of the following types of agents have some indication of how happy they will be in a particular world state?

- a) Simple reflex agent
- b) Model based reflex agent
- c) Goal based agent
- d) Utility based agent
- e) Learning agent

5. What does the following definition refer to?

The strategy finds the highest quality solution when there are several different solutions.

- a) Completeness
- b) Time complexity
- c) Space complexity
- d) Optimality
- e) None of the above

6. Which of these search strategies are complete and optimal?

- a) Breadth first and iterated deepening search
- b) Breadth first and depth first search
- c) Iterated deepening and depth limited search
- d) Depth first and iterated deepening search
- e) None of the above

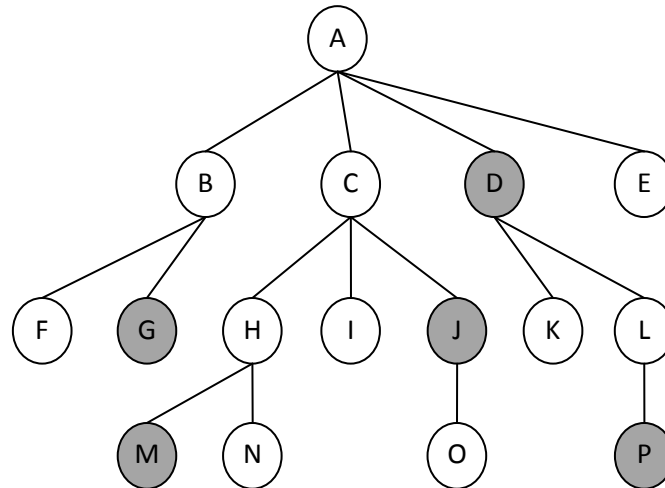
7. The space complexity of Depth First Search is (where b is the maximum branching factor, m is the maximum depth of the state space, and d is the depth of the least-cost solution):

- a) $O(b^{d+1})$
- b) $O(b^d)$
- c) $O(bd)$
- d) $O(b^m)$
- e) $O(bm)$

8. Even if repeated states are detected, which of the following algorithms is not complete?

- a) A* Search
- b) Breadth-First Search
- c) Depth-First Search
- d) Depth Limited Search
- e) None of the above

The next two questions refer to the following tree:



9. What order will the shaded nodes in the tree above be expanded for a breadth-first search?

- a) GMJDP
- b) MPGJD
- c) DJGMP
- d) DPJMG
- e) DGJMP

10. What order will the shaded nodes in the tree above be expanded for depth limited search with $l=2$?

- a) DGJ
- b) GJD
- c) GMJDP
- d) DGJMP
- e) DDGJDGJMP

11. Which node in the fringe does A* search expand first?

- a) The node closest to the goal as given by the heuristic function
- b) The node on the least-cost solution path as given by the heuristic and cost function
- c) The node that will always lead to the optimal path
- d) Options b and c
- e) None of the above

12. Which one of the following is true about Greedy search?

- a) Always complete and optimal
- b) Only optimal and complete if the heuristic used is admissible
- c) Complete if the limit is set to below the depth of the shallowest solution
- d) Optimal in finite spaces with repeated state checking
- e) None of the above

13. Heuristic h_1 dominates heuristic h_2 if

- a) h_1 never overestimates the cost to reach the goal but h_2 does
- b) $h_2(n) \geq h_1(n)$ for all n , and h_2 never overestimates the cost to reach the goal
- c) $h_2(n) \leq h_1(n)$ for all n , and h_1 never overestimates the cost to reach the goal
- d) $h_2(n) \geq h_1(n)$ for all n , and h_1 never overestimates the cost to reach the goal
- e) None of the above

14. Which of the following definitions describes the hill climbing algorithm?

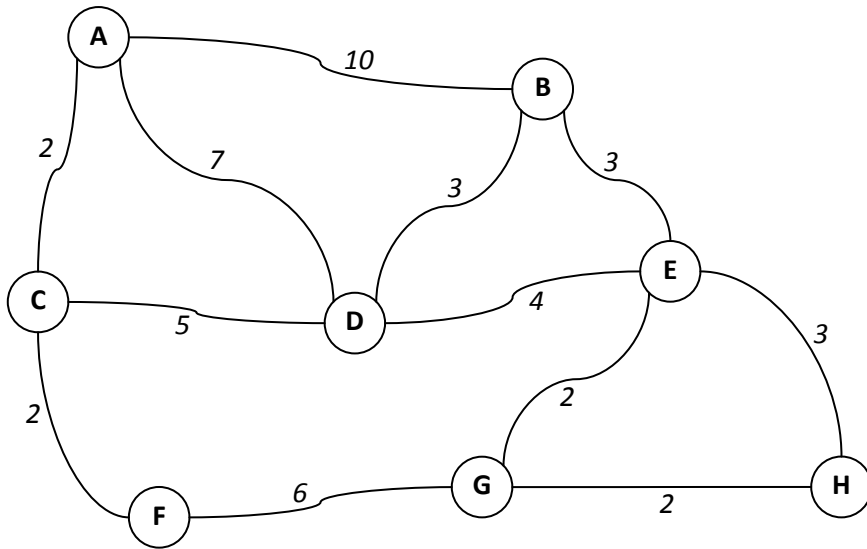
- a) Search by selecting an action that improves the current state
- b) Search by selecting actions stochastically according to a decreasing temperature
- c) Search by using a population of states subject to evolutionary selection to find improved states
- d) Search by iteratively setting a random initial condition then by selecting an action that improves the current state
- e) Search by using a population of agents that use heuristics and pheromone values to find improved states

15. In alpha-beta pruning

- a) Alpha can never decrease
- b) The best move will never be pruned away
- c) Ordering the evaluated nodes can affect the efficiency of the algorithm
- d) All of the above
- e) None of the above

The next two questions refer to the following map and table:

Map showing states and path costs:



Heuristic values of states:

A	10	E	2
B	4	F	7
C	9	G	2
D	6	H	0

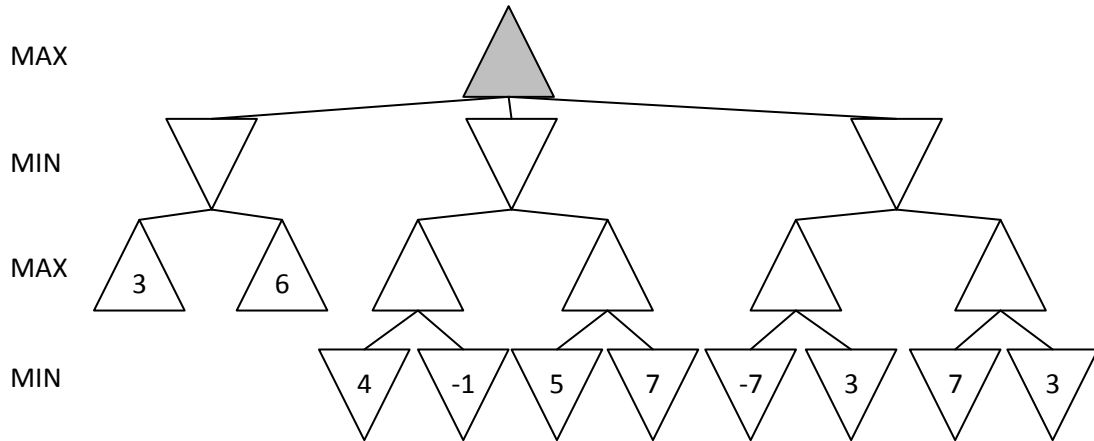
16. With the initial state being A and the goal state being H, what solution path does the Greedy search algorithm find in the above diagram?

- a) ACFGH
- b) ACDEH
- c) ADEH
- d) ABEH
- e) ADBEH

17. With the initial state being A and the goal state being H, what solution path does the A* search algorithm find in the above diagram?

- a) ACFGH
- b) ACDEH
- c) ADEH
- d) ABEH
- e) ADBEH

The next two questions refer to the following game tree:



18. In the tree above, what is the MiniMax value of the initial (shaded) node?

- a) 3
- b) 4
- c) 5
- d) 6
- e) 7

19. In the tree above, how many times will a branch be pruned using alpha-beta pruning?

- a) 0
- b) 1
- c) 2
- d) 3
- e) 4

20. The game tree for a game of chance can be searched using

- a) Quiescence
- b) Singular extensions
- c) Expectiminimax
- d) All of the above
- e) None of the above

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