18CSC305J - Artificial Intelligence

Unit 2

MCQ QUESTIONS

#	Question	Answer
1	Which search is implemented with an empty first-in-first-out queue? A. Depth-first search B. Breadth-first search C. Bidirectional search D. None of the mentioned	B
2	What is the other name of informed search strategy? A. Simple search B. Heuristic search C. Online search D. None of the mentioned	B
3	A* algorithm is based on _____ A. Breadth-First-Search B. Depth-First-Search C. Uniform Cost Search D. Best-First-Search	D

4	Strategies that know whether one non-goal state is “more promising” than another are called A. Informed & Unformed Search B. Unformed Search C. Heuristic & Unformed Search D. Informed & Heuristic Search	D

5	Which of the following algorithms keeps track of 'k' states instead of just one? A. Hill-Climbing search B. Local Beam search C. Stochastic hill-climbing search D. Random restart hill-climbing search E. None of these	B
6	A common assumption about the players in a game is that A. Neither player knows the payoff matrix. B. The players have different information about the payoff matrix. C. Only one of the players pursues a rational strategy. D. The specific identity of the players is irrelevant to the play of the game.	D
7	Which search implements stack operation for searching the states? A. Depth-limited search B. Depth-first search C. Breadth-first search D. None of the mentioned	B
8	Though local search algorithms are not systematic, key advantages would include _____ A. Less memory B. More time C. Finds a solution in large infinite space D. Less memory & Finds a solution in large infinite space	D

9	Uninformed search strategies are better than informed search strategies. A. True B. False	A

10	The_____is a touring problem in which each city must be visited exactly once. The aim is to find the shortest tour. A. Finding shortest path between a source and a destination B. Travelling Salesman problem C. Map coloring problem D. Depth first search traversal on a given map represented as a graph	B
11	When is breadth-first search optimal? A. When there is less number of nodes B. When all step costs are equal C. When all step costs are unequal D. Both a & c	B
12	When will Hill-Climbing algorithm terminate? A. Stopping criterion met B. Global Min/Max is achieved C. No neighbor has higher value D. All of the above	C
13	Is optimality and completeness exists in bidirectional search algorithm? A. Yes, Yes B. No, Yes C. Yes, No D. No, No	A

14	Best-First search is a type of informed search, which uses _____ to choose the best next node for expansion. A. Evaluation function returning lowest evaluation B. Evaluation function returning highest evaluation C. Evaluation function returning lowest & highest evaluation D. None of them is applicable	A

15	Which search is equal to minimax search but eliminates the branches that can't influence the final decision? A. Depth-first search B. Breadth-first search C. Alpha-beta pruning D. None of the above	C
16	Which values are independent in minimax search algorithm? A. Pruned leaves x and y B. Every states are dependent C. Root is independent D. None of the above	A
17	For general graph, how one can get rid of repeated states? A. By maintaining a list of visited vertices B. By maintaining a list of traversed edges C. By maintaining a list of non-visited vertices D. By maintaining a list of non-traversed edges	A
18	DFS is_____efficient and BFS is_____efficient. A. Space, Time B. Time, Space C. Time, Time D. Space, Space	A

19	Which of the following are the two key characteristics of the Genetic Algorithm? A. Crossover techniques and Fitness function B. Random mutation and Crossover techniques C. Random mutation and Individuals among the population D. Random mutation and Fitness function E. None of these	A

20	Hill-Climbing technique stuck for which of the following reasons? A. Local maxima B. Ridges C. Plateaux D. All of these E. None of these	D
21	How many successors are generated in backtracking search? A. 1 B. 2 C. 3 D. 4	A
22	Which value is assigned to alpha and beta in the alpha-beta pruning? A. alpha = max B. alpha = min C. beta = min D. Both A and C	D
23	Which of the mentioned properties of heuristic search differentiates it from other searches? A. It provides solution in a reasonable time frame B. It provides the reasonably accurate direction to a goal C. It considers both actual costs that it took to reach the current state and approximate cost it would take to reach the goal from the current state D. All of the above	D

24	What is most important to be concerned with in the evolution of repetitive problems? A. Do multiple runs until a good solution is found B. Execute one run until the solution is good enough C. Get a reasonably good solution every time D. Get a very good result just once	C

25	General algorithm applied on game tree for making decision on win/lose is A. DFS/BFS search algorithm B. Heuristic search algorithm C. Greedy search algorithm D. Minmax algorithm	D
26	Which one of the following is a part of every game theory model? A. Players. B. Payoffs C. Probabilities D. Strategies	D
27	Which of the following describes Nash equilibrium? A. A firm chooses its dominant strategy, if one exists. B. Every competing firm in an industry chooses a strategy that is optimal given the choices of every other firm. C. Market price results in neither a surplus nor a shortage. D. All firms in an industry are earning zero economic profits.	B
28	A prisoners' dilemma is a game with all of the following characteristics except one. A. Players cooperate in arriving at their strategies. B. Both players have a dominant strategy. C. Both players would be better off if neither chose their dominant strategy. D. The payoff from a strategy depends on the choice made by the other player.	A

29	The heuristic path algorithm is a best-first search in which the evaluation function is f(n) = (2 − w)g(n) + wh(n). What kind of search does this perform for w = 1? A. Uniform cost search B. A* search C. Greedy best-first search	B

	D. None of the above	
30	A genetic algorithm (or GA) is a variant of stochastic beam search in which successor states are generated by combining two parent states, rather than by modifying a single state. A. True B. False	A
31	Adversarial search problems uses _____ a) Competitive Environment b) Cooperative Environment c) Neither Competitive nor Cooperative Environment d) Only Competitive and Cooperative Environment	Answer : a
32	Zero sum game has to be a_____game. a) Single player b) Two player c) Multiplayer d) Three player	c
33	General algorithm applied on game tree for making decision of win/lose is a) DFS/BFS Search Algorithms b) Heuristic Search Algorithms c) Greedy Search Algorithms d) MIN/MAX Algorithms	d
34	What is the complexity of minimax algorithm? a) Same as of DFS b) Space – bm and time – bm c) Time – bm and space – bm d) Same as BFS	a

35	Which of the following for the game can be defined by the initial state and the legal moves for each side? (A). Search Tree (B). Forest (C). State Space Search (D). Game Tree (E). Goal State	D

Sample Part-B Questions

1. Write the heuristic estimation function for A* search?
2. State the advantages of the local search algorithm.
3. Define Heuristic function, h (n).
4. When will Hill-Climbing algorithm terminate?
5. How a game formulated as a search problem?
6. List any two memory bounded algorithms.
7. Differentiate online search and offline search.
8. List some of the variants of hill-climbing.
9. Draw the State Space diagram for Hill Climbing search problem. Identify the problems in different regions in Hill climbing. Give reason.
10. State the difference between heuristic and adversarial search
11. Differentiate Blind Search and Heuristic Search.
12. What are the disadvantages of Hill climbing Algorithm and how can you overcome it ?
13. What do you understand by adversarial search ?
14. What is pruning ?
15. Brief the elements of game playing search.
16. Define Maximin Strategy.
17. List the limitations of Minmax algorithm

Sample Part-C Questions

1. Explain Uniform Cost Search Algorithm with an example.

   Brief Generate and Test Strategy.

2. Explain Travelling Salesman Problem with an example

3. Brief the parameters for evaluating Search Algorithms .

4. Illustrate any local search algorithm.

5. Solve the following mixed strategy game.

	Y1	Y2
X1	4	2
X2	0	10

6.A professional athlete , Biff Rhino , and his agent , Jim Fence , are renegotiating Biff's contract with the general manager of the Texas Buffaloes , Harry Sligo . The various outcomes of this game situation is organized into a payoff table as shown below.

	General Manager Strategy		
Athlete/Agent Strategy	A	B	C
1	$50,000	$35,000	$30,000
2	60,000	40,000	20,000

The athlete and agent want to maximize the athlete's contract , and the general manager hopes to minimize the athlete's contract . Using maximin and minimax strategies work out the optimal strategy for athlete as well as the general manager . Does this game situation have a saddle point ? Substantiate your answers with appropriate reasoning .

7.The Coloroid Camera Company (referred to as company I) is going to introduce a new camera into its product line and hopes to capture as large an increase in its market share as possible. In contrast, the Camco Camera Company (referred to as company II) hopes to minimize Coloroid's market share increase. Coloroid and Camco dominate the camera market, and any gain in market share for Coloroid will result in a subsequent identical loss in market share for Camco. The strategies for each company are based on their promotional campaigns, packaging, and cosmetic differences between the products. The payoff table,

which includes the strategies and outcomes for each company (I Coloroid and II Camco), is shown below. The values in the table are the percentage increases or decreases in market share for company I.

Company I Strategy	Company II Strategy		
	A	B	C
1	9	7	2
2	11	8	4
3	4	1	7

Apply Maximin decision criteria and Minimax criteria and check whether the two strategies result in an equilibrium point . Identify dominant strategies and eliminate them .