

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	<p>(a) A DFS is started at node 'a'. The nodes are listed in the order they are first visited.</p> <pre> graph LR a((a)) --- b((b)) a --- d((d)) b --- c((c)) b --- e((e)) d --- e d --- g((g)) c --- e e --- f((f)) e --- g </pre> <p>Write all the possible output paths.</p> <p>(b) Write a python code of BFS algorithm.</p>	CO-8	2
Q2	<p>(a) How does the A* algorithm work (write pseudo code)? What if the search space in A* algorithm is not a grid and is a graph?</p> <p>(b) What is the difference between heuristic search and uninformed search?</p>	CO-7	3
Q3	<p>(a) How does Dyna-Q balance between learning from real experiences and simulated experiences?</p>	CO-4	1.5

	(b) How does Dyna-Q compare to Monte Carlo and TD methods?		1.5
	(c) Explain the working principles of the Double Q Learning algorithm in reinforcement learning (write pseudo code).		2
Q4	(a) How does DQN compare to Policy Gradient methods?	CO-7	2
	(b) What is the difference between an online Q-network and a target Q-network?		3
Q5	(a) Explain the working principles of the Dynamic Programming (all types) in reinforcement learning.	CO-5	2
	(b) Why do regular Q-Learning and Deep Q Network overestimate the Q values?		2
Q6	(a) Let p, q, r denote the statements "it is raining", "it is cold", "it is pleasant". Then the statements "It is not raining and it is pleasant and it is not pleasant only if it is raining and it is cold". Write the logical representation.	CO-8	1
	(b) What is Simulated Annealing, and how does it overcome the limitations of Hill Climbing?		2