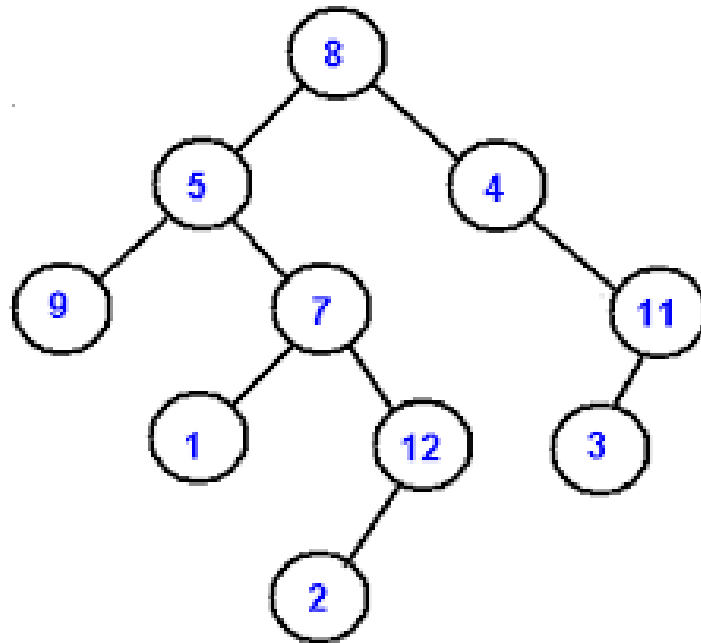


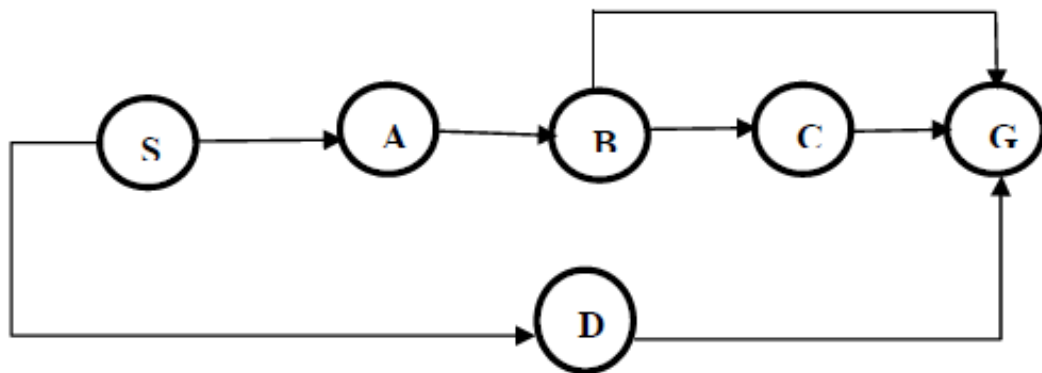
MODEL QUESTIONS

Course: Foundations of AI & ML (CY51)

1. Define Artificial Intelligence and explain why it is important to study AI.
2. Explain the four main approaches that define AI: Thinking Humanly, Acting Humanly, Thinking Rationally, and Acting Rationally.
3. Discuss the main challenges faced in building intelligent systems.
4. Differentiate between Weak AI and Strong AI with examples.
5. Describe the concept of Rationality in AI and explain how Rational Agents are evaluated using a Performance Measure.
6. Briefly trace the historical milestones in the development of Artificial Intelligence
7. Define an Intelligent Agent. Explain the structure of agents and environments using the PEAS framework.
8. Construct PEAS specifications for the following:
(i) Autonomous Taxi Driver (ii) Weather Forecasting System
9. Differentiate between Reflex, Model-based, Goal-based, and Utility-based Agents with examples.
10. Formulate a PEAS description for an Intelligent Tutoring System.
11. Explain the components of a well-defined problem with an example.
12. Apply Breadth-First Search (BFS) to the following graph starting from node 8 to goal node 3. Show all steps, including Open and Closed lists.



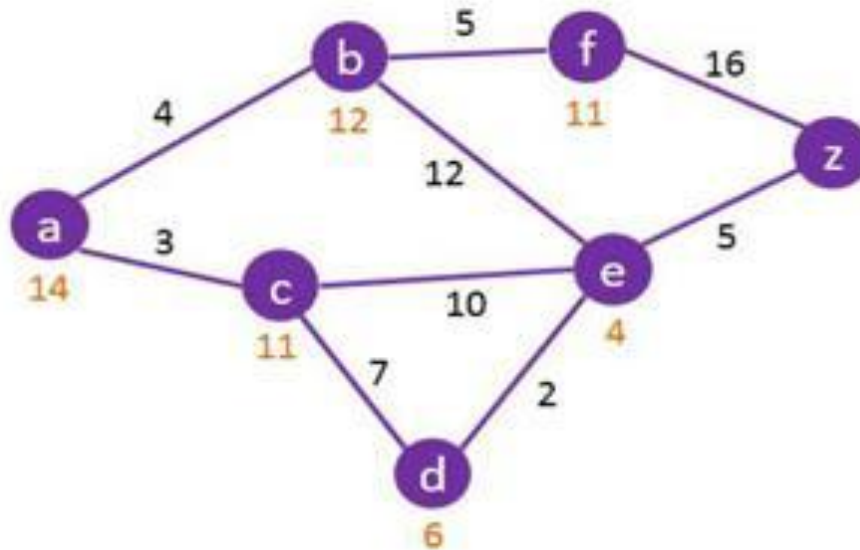
13. Apply Depth-First Search (DFS) on the following graph with Source as S and Goal as G, and compare results with BFS.



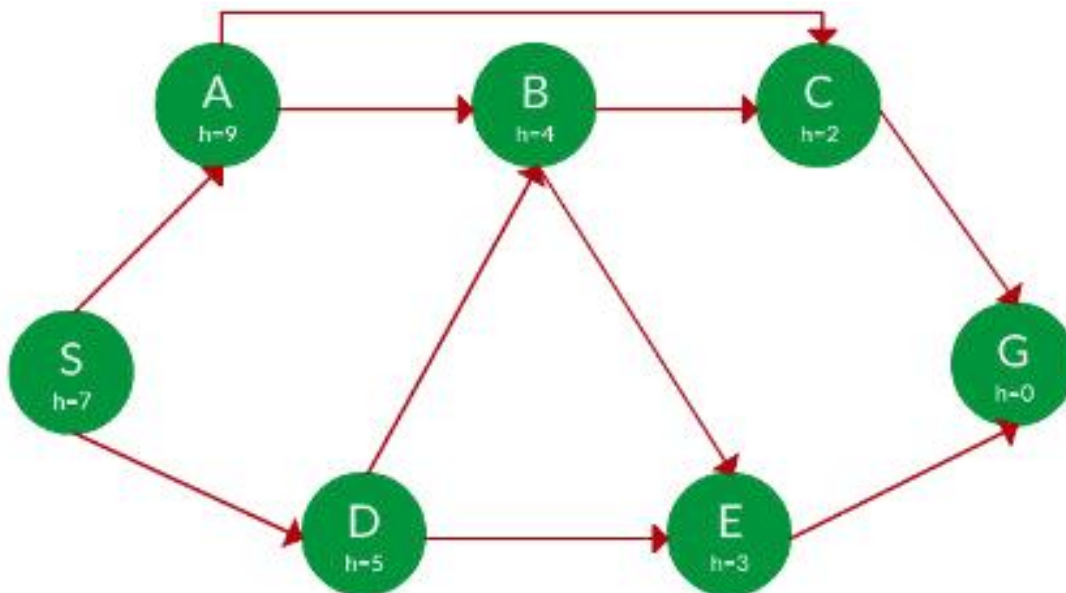
14. Explain Depth-Limited Search and Iterative Deepening Search with examples.

15. Define heuristic function. How does it help in Informed Search?

16. For the following graph, apply Best-First Search and show the order of node expansion and final path to goal.

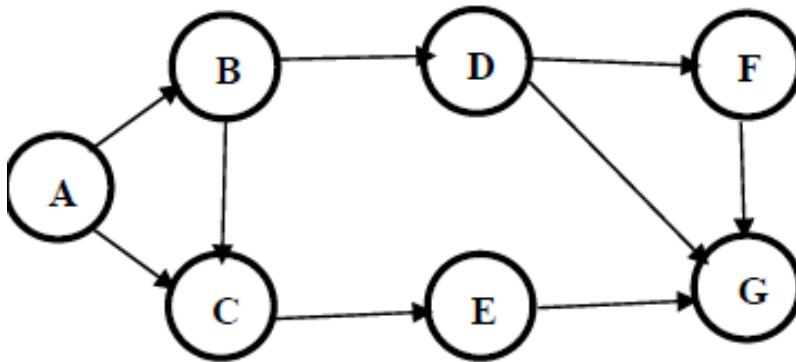


17. Explain A* Search algorithm in detail.
18. Apply A* Search to find the shortest path from node A to node G for the graph below. Clearly show $g(n)$, $h(n)$, and $f(n)$ values for each node.



19. Differentiate between Uninformed and Informed Search strategies.
20. Write the advantages and limitations of each search algorithm: BFS, DFS, UCS, Greedy, and A*.

21. Apply Iterative Deepening Search to solve a 3-node graph where the goal node is at depth 3. Show how the algorithm converges.
22. Explain the role of heuristics and admissibility in A* Search.
23. Explain the properties of heuristic search: Completeness, Optimality, Time and Space Complexity.
24. Compare Greedy Best-First Search and A* Search with respect to heuristic accuracy.
25. Apply Best First Search and A* Search to find the shortest path from node A to node G for the graph below. Clearly show $g(n)$, $h(n)$, and $f(n)$ values for each node.



A	5
B	6
C	4
D	3
E	3
F	1
G	0