

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
Computer Science & Engineering-AI&ML
B. Tech. Sem - IV :SUMMER : 2023
SUBJECT : FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

Day : Wednesday
 Date : 31-05-2023

S-23950-2023

Time : 10:00 AM-01:00 PM
 Max. Marks : 60

N.B.

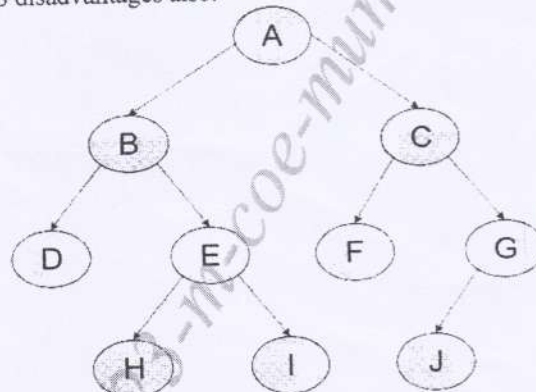
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non – programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

Q.1 Explain Goal Based Agent with neat diagram? What are disadvantages of Simple Reflex Agent? (10)

OR

What do you mean by PEAS descriptors? Give PEAS description for a robot soccer player? (10)

Q.2 Apply DFS on following tree with A is start node and H as goal node. List the DFS disadvantages also. (10)



OR

Given an initial state and final state in 8-Puzzle: (10)

2	8	3
1	6	4
7		5

Initial State

	2	3
1	8	4
7	6	5

Final State

Find the most cost-effective path to reach final state from initial state using A* algorithm. Consider $g(n)$ = depth of node and $h(n)$ = number of misplaced tiles.

Q.3 Define constraint satisfaction problem. Solve Australia Map Coloring Problem using backtracking search and arc consistency. (10)

- a. To formulate this as a CSP, we define the variables to be the regions: WA, NT, Q, NSW, V, SA, and T.
 - b. The domain of each variable is the set {red, green, blue}
 - c. The constraints require neighboring regions to have distinct colors
- (Note: use color name as representation of color don't west time in coloring the map).

P.T.O.

OR

What do you mean by Adversarial search? Explain Alpha-Beta pruning with example? (10)

Q.4 Consider following statements: (10)

1. Rimi is hungry.
 2. If Rimi is hungry, then she barks.
 3. If Rimi is barking, Raja becomes angry.
- Prove "Raja is angry" using resolution technique.

OR

Find the colour of a pet named Filch, given that he eats flies and croaks. The following four rules are there in rule base: (10)

- R1: If Y eats flies and Y croaks => Then Y is a frog
R2: If Y sings and Y chirps => Then Y is a canary
R3: If Y is a canary => Then Y is yellow
R4: If Y is a frog => Then Y is green

Find solution using both forward chaining as well as backward chaining.

Q.5 What are disadvantages of Bayesian theory? Explain Dempster-Shafer theory. (10)

OR

What do you mean by Hierarchical Planning? Explain in detail. (10)

Q.6 What do you mean by expert systems? Explain rule-based systems architecture with neat diagram. (10)

OR

Explain neural network architectures. (10)

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