Name: **Enrolment No:**	

UPES

End Semester Examination, Dec 2024

Course: Artificial Intelligence **Semester: III**

Program: MCA **Time : 03 hrs.**

Course Code: CSAI8010P **Max. Marks: 100**

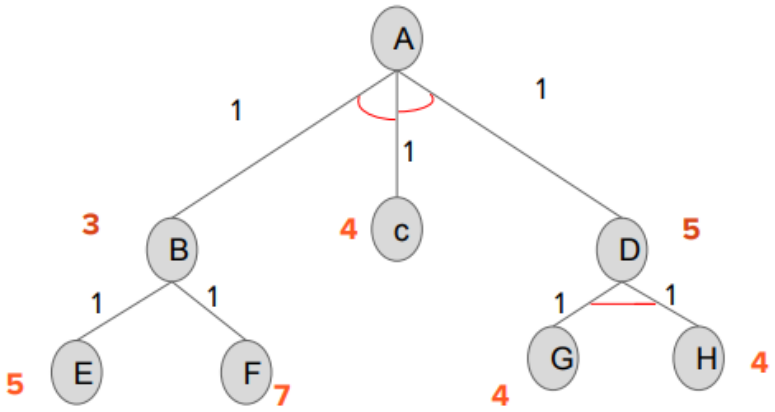
Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	How does Artificial Intelligence mimic human cognitive functions, and in what ways is it different?	**4**	**CO1**
Q 2	Define Artificial Superintelligence (ASI) and explain why it is viewed as both a potential advantage and a significant risk.	**4**	**CO1**
Q 3	Define fuzzy logic and explain how it differs from traditional binary logic in terms of handling uncertainty and partial truth values.	**4**	**CO2**
Q 4	How is semantic network used in AI to represent knowledge, and what is its structure?	**4**	**CO3**
Q 5	Shows that $p \leftrightarrow q$ and $(p \wedge q) \vee (\sim p \wedge \sim q)$ are logically equivalent.	**4**	**CO4**

SECTION B
(4Qx10M= 40 Marks)

Q 6	How does Artificial General Intelligence (AGI) differ from Artificial Narrow Intelligence (ANI), and why is AGI considered a major milestone in the evolution of AI?	**10**	**CO1**
Q 7	Explain the concepts of backward and forward chaining in expert systems. Provide examples of scenarios where each approach would be more effective.	**10**	**CO2**
Q 8	How does Depth-First Search (DFS) handle large search spaces compare to Breadth-First Search (BFS)? Discuss the advantages and limitations of both algorithms in uninformed search scenarios.	**10**	**CO3**
Q 9	Write the following English sentences in symbolic form using propositional logic and logical connectives a) If it rains, then I will stay at home. b) It is false that he is poor but not honest. c) I will go only if he stays. d) Either today is Sunday or Monday. e) I will go if he stays.	**10**	**CO4**

SECTION-C (2Qx20M=40 Marks)			
Q 10	What does "AO*" stand for in the context of search algorithms, and how does it differ from the standard A* search algorithm in terms of its approach and application? Explain how AO* works for the following:  	**20**	**CO3, CO4**
Q 11	Explain how the A* algorithm is applied to solve the 8-puzzle game, ensuring an optimal solution. In your answer, discuss the significance of the heuristic function (such as Manhattan distance or misplaced tiles) and the cost function in guiding the search. How do these components work together to prioritize the most promising moves? Provide a step-by-step example of the algorithm's execution, highlighting the selection of nodes, expansion of states, and the eventual solution to the puzzle. OR How does knowledge representation in AI utilize different formal languages, such as propositional logic, predicate logic, and semantic networks? Compare and contrast these approaches in terms of their expressiveness, computational complexity, and suitability for various AI applications, providing examples for each. Using Propositional logic Show that $[(p \rightarrow q) \wedge (q \rightarrow r)] \rightarrow (p \rightarrow r)$is a tautology	**20**	**CO3, CO4**