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SDM Institute of Technology, Ujire

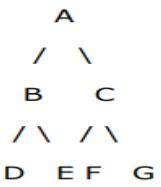
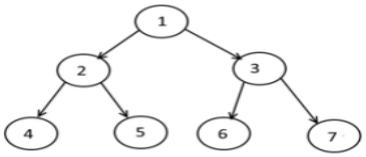
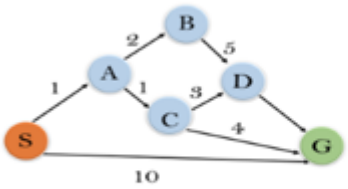
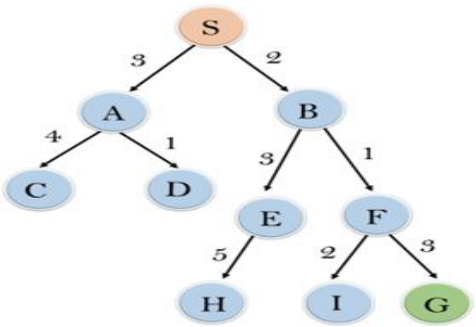
II Internal Assessment Test (February 2024)

Principles of Artificial Intelligence (21AI54)

Class: V Sem **Time: 90 minutes** **Max. Marks: 40**

Each Full question carries 8 Marks. Answer ONE full question from each Part.

Note: Missing data can be assumed suitably

		PART – A	Marks	Cos	RBT Level
1.	**(a)**	Design and explain the Depth First Search Algorithm with example	8	CO2	L2
		OR			
2.	**(a)**	Apply Depth First search for the following using LIFO Queue (Stack):   	8	CO2	L2
		PART – B			
3.	**(a)**	Apply A* Best First Search for the following with S as a Start node and G as goal. Find the Optimal path by applying A* Algorithm and making use of Closed list and Open list.  State / h(n): S 5; A 3; B 4; C 2; D 6; G 0	8	CO2	L3
		OR			
4.	**(a)**	Apply Greedy Best First Search for the following with **S** as a Start node and **G** as goal. Find the Optimal path by applying Greedy Best First Search Algorithm using Closed list and Open list.  node / H (n): A 12; B 4; C 7; D 3; E 8; F 2; H 4; I 9; S 13; G 0	8	CO2	L3

		PART – C			
5.	**(a)**	Discuss how heuristic functions can be selected making use of the following four approaches for 8 puzzles: 1. The effect of heuristic accuracy on performance 2. Generating admissible heuristics from relaxed problems: 3. Generating admissible heuristics from subproblems: Pattern databases 4. Learning heuristics from experience	8	CO4	L3
		OR			
6.	**(a)**	Defining the meaning of Logical agents discuss how the knowledge can be represented using sematic networks and Propositional Logic. Provide a detailed description of Wumpus World, including its PEAS (Performance measure, Environment, Actuators, Sensors) description.	8	CO4	L3
		PART – D			
7.	**(a)**	Explain the following with examples 1.Algorithm to convert a given formula to CNF 2.Algorithm/Steps to prove by resolution.	8	CO3	L2
		OR			
8.	**(a)**	Express the simple Knowledge base of Wumpus World using syntax and semantics of Propositional logic. Define the following: *Horn clauses, Definite Clauses, Forward Chaining and Backward Chaining.*	8	CO3	L2
		PART – E			
9.	**(a)**	Discuss the syntax and BNF Grammar of Propositional logic. Express the following sentences in conjunctive normal form. 1.$(A \rightarrow B) \rightarrow C$ 2. $A \rightarrow (B \rightarrow C)$ 3.$(A \rightarrow B) \vee (B \rightarrow A)$ 4.$(P \rightarrow (Q \rightarrow R)) \rightarrow (P \rightarrow (R \rightarrow Q))$	8	CO3	L3
		OR			
10.	**(a)**	For each of the following English sentences, write a corresponding sentence in FOL. 1.The only good extraterrestrial is a drunk extraterrestrial. 2.The Barber of Seville shaves all men who do not shave themselves. 3.There are at least two mountains in England. 4.There is exactly one coin in the box. 5.There are exactly two coins in the box. 6.The largest coin in the box is a quarter. 7.No mountain is higher than itself. 8.All students get good grades if they study.	8	CO3	L3

II Assignment (February 2024)

Each Question carries 5 Marks. **Answer all questions.** **Max. Marks: 10**

1.	Differentiate between Unit Resolution and Complete Resolution with examples	5	CO3	L2
2.	Explain the syntax of first-order logic with equality, specified in Backus–Naur form	5	CO4	L2