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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science and Engineering

Final Examination, Spring 2025

Course Code: CSE411, Course Title: Artificial Intelligence

Level: 4 Term: 1 Batch: 61

Time: 02:00 Hours **Marks: 40**

Answer ALL Questions

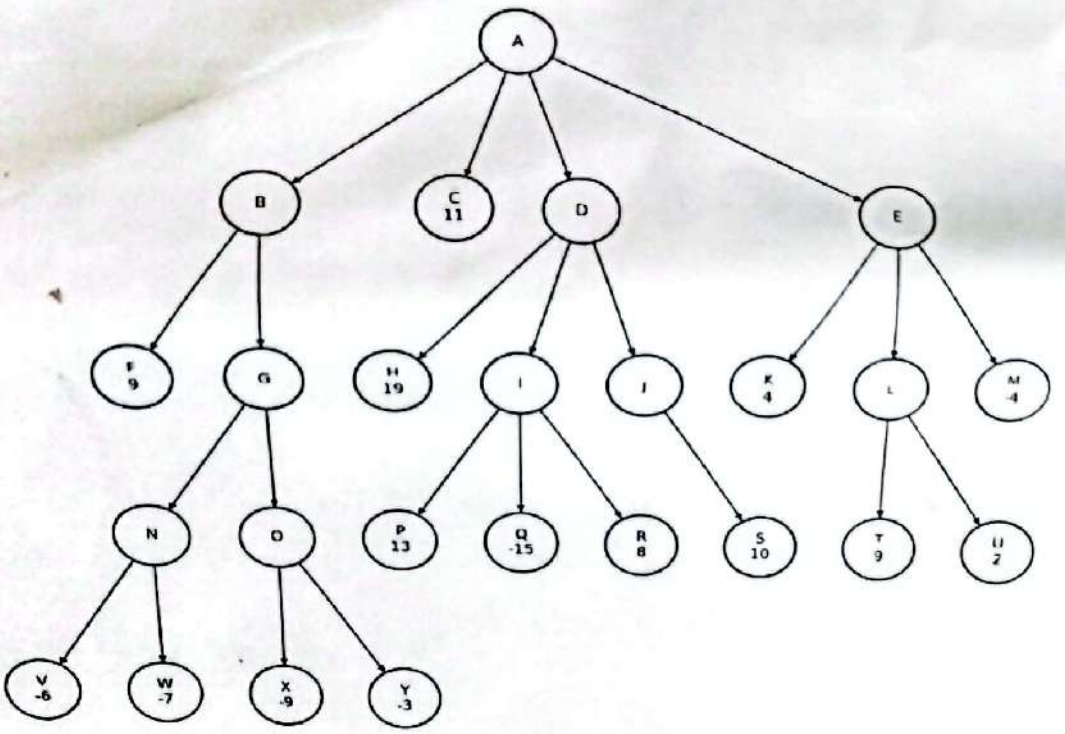
[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	*a)*	**Analyze** formal grammar and Chomsky hierarchy for NLP.	5	CO4
	b)	**Explain** a multilayer neural network-based NER (Named Entity Recognition) project on image (eg. License plate recognition).	5	
2.	*a)*	**Discuss** general logic characteristics with the help of entailment.	3	CO2
	b)	**Identify** KB entails sentence 'α' if and only if 'α' is true in all words where KB is true. Let consider, KB = $(p \wedge q)$, $(\neg p \wedge \neg r)$ and $\alpha = \neg p \wedge (q \vee \neg r)$ and apply on the truth table.	2	
	c)	**Predict** truth table on this statement considering propositional symbols "I make you Appetizer, Dinner, and Dessert".	5	
3.	*a)*	**Demonstrate** uncertainty reasons which creates ambiguity in Autonomous Agent.	5	CO3
	b)	The full joint distribution on the following table describes the probabilities of the combinations of vehicle types and vehicle owners. **Applying** these probabilities analyze the following questions. *i)* Determine the probability that a vehicle owner is under 30 years old. *ii)* Determine P(vehicle type =Minivan | age of owner is under 30) *iii)* Determine P(vehicle type = SUV ∨ age of owner is over 50)	5	
4.		Perform the following questions and answer each question respectively.		CO2

Age of owner	Car	Minivan	SUV
under 30	0.15	0.05	0.1
between 30 and 50	0.1	0.15	0.1
over 50	0.15	0.15	0.05

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a) **Identify** the solution using a minimax search on the following tree. 5



b) **Identify** a solution on the following tree which reduces node traversing. 5

