



**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

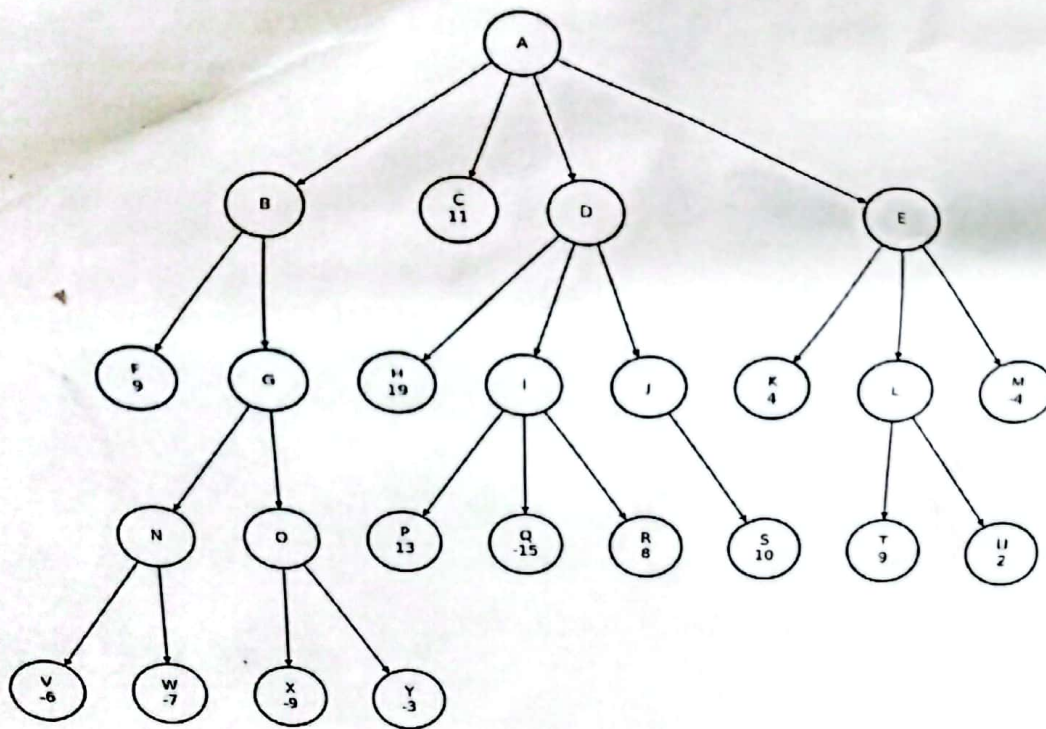
*[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]*

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 ' $\alpha$ ' if and only if ' $\alpha$ ' is true in all worlds 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 $P(\text{vehicle type} = \text{Minivan} \mid \text{age of owner is under 30})$ iii) Determine $P(\text{vehicle type} = \text{SUV} \mid \text{age of owner is over 50})$  <table><tr><td>Age of owner</td><td>Car</td><td>Minivan</td><td>SUV</td></tr><tr><td>under 30</td><td>0.15</td><td>0.05</td><td>0.1</td></tr><tr><td>between 30 and 50</td><td>0.1</td><td>0.15</td><td>0.1</td></tr><tr><td>over 50</td><td>0.15</td><td>0.15</td><td>0.05</td></tr></table>	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
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4.	Perform the following questions and answer each question respectively.			CO2														



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

