



**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**

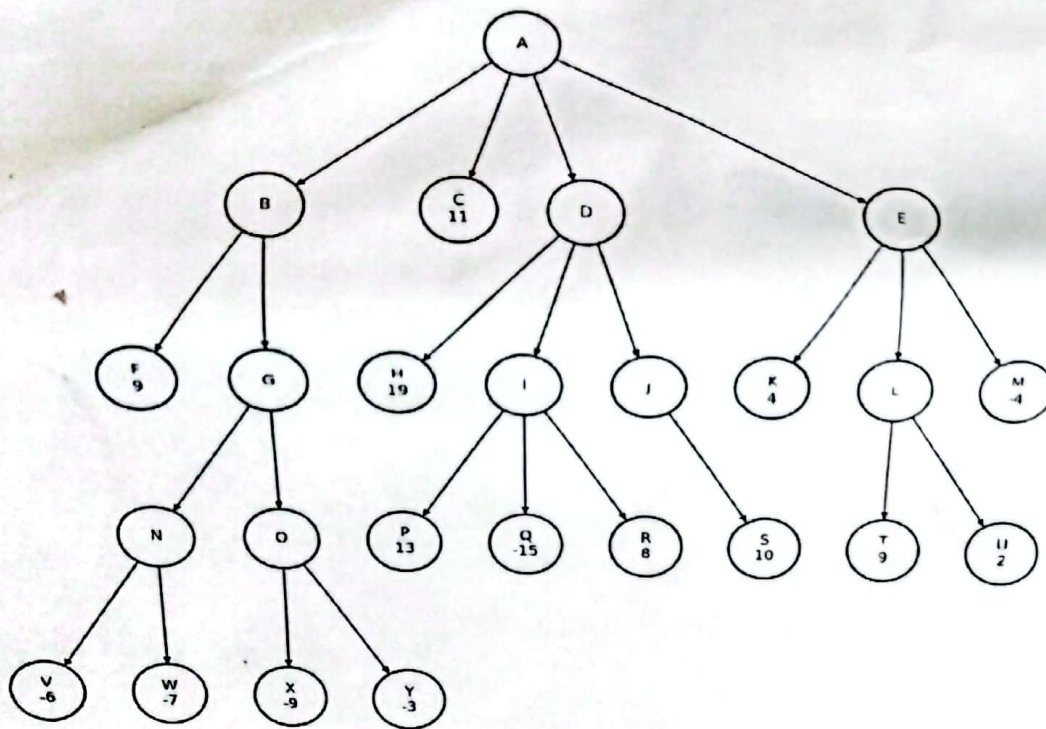
*[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]*

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 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)	<p>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.</p> <p>i) Determine the probability that a vehicle owner is under 30 years old.</p> <p>ii) Determine <math>P(\text{vehicle type} = \text{Minivan} \mid \text{age of owner is under 30})</math></p> <p>iii) Determine <math>P(\text{vehicle type} = \text{SUV} \mid \text{age of owner is over 50})</math></p> <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

