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PRN No.	

PAPER CODE	U315-234D(CSE)

(AY:2025-26) December 2025 (ENDSEM) EXAM

TY (SEMESTER - I)

COURSE NAME: PROFESSIONAL ELECTIVE-I ARTIFICIAL INTELLIGENCE **Branch: COMPUTER ENGINEERING COURSE CODE: CSUA31234D**

T.Y (Pattern 2023) **[Max. Marks: 40]**

Time : [1 Hr. 30 min]

Instructions to candidates:

1) **Figures to the right indicate full marks. Use of scientific calculator is allowed**
2) **Use suitable data wherever required**
3) **All questions are compulsory. Solve any two sub question each from Questions 1 and 2**
4) **Solve any one sub question (2 marks) from Questions 3 ,4 ,5 and 6 and sub question of 4 marks is compulsory from questions 3,4,5,and 6**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Explain PEAS for "Spoken Tutorial"	[4]	1	Apply
	b) Solve the following 8 puzzle instance using Manhattan distance heuristic for following puzzle also explain conditions for unsolvable instance **start** **Goal** 1 2 3 1 2 3 4 7 6 4 5 6 8 - 5 - 7 8	[4]	1	Apply
	c) Explain step-by-step how the backtracking algorithm works to solve a Sudoku puzzle as a CSP. Include how variable selection, value assignment, and constraint checking happen during the process.	[4]	1	Apply
Q2	a) Using resolution, demonstrate how to prove the query "Someone is studying" from the following premises: Everyone study something. If someone studies a person, then the person is understood. Include the clauses and resolution steps.	[4]	2	Apply
	b) Four people A,B,C,D were locked in Big Boss house. The understanding of D is not matching with others so he was kicked off. The probabilities(mass) of understanding were identified as:			

		Understanding	Mass	[4]	2	Apply
		No one is mature	0			
		A is mature	0.2			
		B is mature	0.1			
		C is mature	0.2			
		Either A or B is mature	0.2			
		Either B or C is mature	0.3			
		Either A or C is mature	0.1			
		One of 3 is mature	0.2			
	Given the mass assignments find the maturity belief interval of A or C. Show stepwise results.					
	c) Given the statements: Every employee at Zoho is knowledgeable. Aditi is an employee at Company Zoho. Using resolution in FOL, prove that Aditi is knowledgeable. Show each step including conversion to CNF, negation of the goal, unification, and resolution.			[4]	2	Apply
Q3	a) Which learning paradigm is applicable in following scenarios and why i. Students project work ii. ChatGPT			[2]	3	Under stand
	OR					
	b) Apply the concept of state and action in reinforcement learning: In a robot navigation task, define possible states and actions the agent might encounter and take.			[2]	3	Under stand
	c) Build a perceptron classifier for AND Gate following gate realization.(1 Epoch)			[4]	3	Apply
		A	B	AUB		
		1	1	1		
		1	0	0		
		0	1	0		
		0	0	0		
Q4	a)Differentiate between Azure Machine Learning Studio, and Azure Machine Learning			[2]	4	Under stand
	OR					
	b) Write a note on Image and video processing tool of Amzon			[2]	4	Under stand
	c) Write a note on Amazon Transcribe			[4]	4	Under stand

Q.5	a) What type of explanation does SHAP generate: global or local? Explain briefly. OR b) Differentiate between LIME and SHAP for diabetes prediction example. c) Demonstrate how you would use both LIME and SHAP together to validate the interpretability of a black-box model used for credit scoring. What advantages does combining methods offer	[2] [2] [4]	5 5 5	Under stand Under stand Apply
Q.6	a) Explain the difference between trend and seasonality in time series analysis. OR b) Differentiate between segmentation and tokenization with example. c) Apply the concept of moving average to smooth out a noisy time series representing daily website traffic data.	[2] [2] [4]	6 6 6	Under stand Under stand Apply