Total No. of Printed Pages: 03

PRN No.	

PAPER CODE	U315-234D (RE)

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

TY/B.TECH (SEMESTER - I)

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

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

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 "Self Driving Car"	[4]	1	Apply
	b) Solve the following 8 puzzle instance for the following and 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) Apply alpha-beta pruning to compute the minimax value at node A. Show the order in which nodes are evaluated and indicate any pruned branches. Explain briefly how alpha and beta values are updated during the traversal and how pruning improves the efficiency of the search. A (MAX) / \ B(MIN) C(MIN) / \ / \ D(3) E(5) F(2) G(9)	[4]	1	Apply

<table>
<tr><td>Q2</td><td>a) Consider the following paragraph:
Anything anyone eats is called food. Ram likes all kinds of food. Roti is food. Sabjji is food. Sham eats Mango. Sham eats everything Ram eats. Translate following statements in FOL and answer the following.
i. Does Ram like Mango?
ii. What food Sham eats?
Convert the above statements in FOL and answer the above questions.

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:
<table><tr><td>Understanding</td><td>Mass</td></tr><tr><td>No one is mature</td><td>0</td></tr><tr><td>A is mature</td><td>0.1</td></tr><tr><td>B is mature</td><td>0.2</td></tr><tr><td>C is mature</td><td>0.1</td></tr><tr><td>Either A or B is mature</td><td>0.1</td></tr><tr><td>Either B or C is mature</td><td>0.1</td></tr><tr><td>Either A or C is mature</td><td>0.3</td></tr><tr><td>One of 3 is mature</td><td>0.1</td></tr></table>Given the mass assignments find the maturity belief interval of A or C. Show stepwise results.

c) Convert the statement "For every x, if x is a parent of y then y is a child of x" into clauses suitable for resolution. Show the conversion steps including removing implications, standardizing variables, and Skolemization.</td><td>[4]

[4]

[4]</td><td>2

2

2</td><td>Apply

Apply

Apply</td></tr>
<tr><td>Q3</td><td>a) Differentiate between supervised , unsupervised learning
OR
b) Explain the role of the agent and the environment in a reinforcement learning system. Give a simple example illustrating their interaction.

c) Build a perceptron classifier for OR Gate following gate realization.(1 Epoch)
<table><tr><td>A</td><td>B</td><td>AUB</td></tr><tr><td>1</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>0</td><td>0</td><td>0</td></tr></table></td><td>[2]

[2]

[4]</td><td>3

3

3</td><td>Under stand
Under stand

Apply</td></tr>
</table>

Q4	a)Differentiate between Azure Machine Learning Studio, and Azure Machine Learning	[2]	4	Under stand
	OR			
	b) Write a note on Natural language processing tool of Amzon	[2]	4	Under stand
	c) Write a note on Amazon Textract – document analysis	[4]	4	Under stand
Q.5	a) What type of explanation does LIME generate: global or local? Explain briefly.	[2]	5	Under stand
	OR			
	b) Differentiate between LIME and SHAP	[2]	5	Under stand
	c) Explain how Explainable AI (XAI) can improve trust and transparency in medical diagnosis systems. Illustrate with an example of how XAI helps doctors interpret AI-powered cancer detection.	[4]	5	Apply
Q.6	a) What are the main components of time series data? Briefly define each.	[2]	6	Under stand
	OR			
	b) Define stemming and how it differs from lemmatization.	[2]	6	Under stand
	c) Explain the preprocessing required for time series analysis. Explain with appropriate justification which models will be better for Time Series Forecasting.	[4]	6	Apply