U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January 2024 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Institutional Elective **Duration: 3 hrs.**
Course Code: 20IS7OEAIM **Max Marks: 100**
Course: Artificial Intelligence and machine Learning

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

				CO	PO	Marks
			UNIT - I			
1	a)		List and explain all four approaches/views of AI.	CO1	-	**08**
	b)		Give the PEAS description for "Automated Taxi" agent.	CO1	-	**04**
	c)		Design an algorithm for Breadth-first search as general graph-search algorithm and comment on time and space complexity for the same.	CO2	PO1	**08**
			UNIT - II			
2	a)		Write the A* search algorithm. Illustrate the working of A* search algorithm with an example.	CO2	PO1	**10**
	b)		Write the Hill-climbing search algorithm. Illustrate its working with an example.	CO2	PO1	**10**
			OR			
3	a)		Explain the cryptarithmetic problem for eliminating possibilities and apply the same for solving the following cryptarithmetic problem. CROSS+ROADS=DANGER	CO2	PO1	**10**
	b)		Write the AO* search algorithm. Illustrate its working with an example.	CO2	PO1	**10**
			UNIT - III			
4	a)		Explain the steps in designing a learning system in machine learning.	CO3	PO1	**10**
	b)		Consider the "Japanese Economy Car" concept and instance given in the Table below. Apply Candidate Elimination Learning algorithm to solve the following problem.	CO3	PO1	**10**

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive

			UNIT - IV			
	5	a)	For the below given dataset, apply ID3 algorithm and construct a decision tree. Clearly mention the steps.	*CO3*	*PO1*	**12**
		b)	Analyze the appropriate problems for Decision Tree Learning method.	*CO3*	*PO2*	**08**
			UNIT - V			
	6	a)	Consider a multilayer feed forward neural network. Enumerate and explain the steps in backpropagation algorithm used to train a neural network.	*CO3*	*PO1*	**10**
		b)	Outline the steps for an End-to-End machine learning project. Illustrate the steps with an example.	*CO4*	*PO1*	**10**
			OR			
	7	a)	Explain the concept of Perceptron and its learning with an example.	*CO3*	*PO1*	**10**
		b)	Write and explain the gradient descent algorithm for training a linear unit.	*CO3*	*PO1*	**10**

Weather	Temperature	Humidity	Windy	Play Tennis?
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

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