GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2024

Subject Code:3170924   **Date:28-05-2024**
Subject Name:AI and Machine Learning
Time:02:30 PM TO 05:00 PM   **Total Marks:70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Elaborate the concept of Artificial Intelligence with its importance in human life.	03
	(b)	Analyze the supervised and unsupervised learning.	04
	(c)	Narrate the history of Artificial Intelligence.	07
Q.2	**(a)**	Differentiate between fuzzy and crisp logic.	03
	(b)	Elaborate single cell biological neural network and single layer artificial neural network.	04
	(c)	Evaluate any three activation functions.	07
		OR	
	(c)	Explain Logistic Regression approach in Machine Learning.	07
Q.3	**(a)**	Enlist the steps involved feature selection in machine learning.	03
	(b)	Explain back propagation neural networks.	04
	(c)	Explain Perceptron NN and multi layer perceptron NN.	07
		OR	
Q.3	**(a)**	Elaborate the concept of a Decision Tree in Machine Learning.	03
	(b)	Discuss the different types of membership functions used in fuzzy logic.	04
	(c)	Evaluate application of neural network and justify the need of using neural network in the applications.	07
Q.4	**(a)**	What is Fuzzy Inference System (FIS)? Explain with neat and clean diagram.	03
	(b)	With the help of a flowchart, explain the concept of Genetic Algorithm and importance of Mutation and Crossover for the same.	04
	(c)	List application of genetic algorithm with proper justification and diagrams.	07
		OR	
Q.4	**(a)**	Explain the concept of decision boundary and Kernel trick w.r.t Supportvector machines (SVM).	03
	(b)	What are decision trees? Explain the meaning of decision node and leafnode.	04
	(c)	Clearly explain how Machine Learning (ML) is helpful in medical sector of the society.	07
Q.5	**(a)**	Elaborate roulette wheel selection method in genetic algorithm.	03
	(b)	Explain agglomerative hierarchical clustering in brief.	04
	(c)	Elaborate fuzzy sets, membership function and defuzzification.	07
		OR	
Q.5	**(a)**	Explain K-means clustering.	03
	(b)	Explain genetic algorithm operator: Cross over with binary string.	04
	(c)	Explain Methods of Defuzzification.	07

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