GUJARAT TECHNOLOGICAL UNIVERSITY
MCA INTEGRATED– SEMESTER VII- EXAMINATION –SUMMER-2024

Subject Code: 2678601   **Date: 09/05/2024**

Subject Name: 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. Use of simple calculators and non-programmable scientific calculators are permitted.

Q.1	**(a)**	Explain, in details, the process of K-fold cross-validation.	**07**
	(b)	Differentiate supervise learning, unsupervised learning & reinforcement learning.	**07**
Q.2	**(a)**	Explain the algorithm for KNN with suitable example.	**07**
	(b)	Explain the concept of Naive Bayesian theorem.	**07**

OR

	(b)	Discuss the random forest model in detail. What are the features of random forest?	**07**
Q.3	**(a)**	Discuss the concept of Bayes' theorem in brief.	**07**
	(b)	What is feature engineering? Explain, in details, the different aspects of feature engineering?	**07**

OR

Q.3	**(a)**	What is feature selection? Why is it needed? What are the different approaches of feature selection?	**07**
	(b)	List the feature extraction algorithms. Discuss PCA in brief.	**07**
Q.4	**(a)**	What are the broad three categories of clustering techniques? Explain the characteristics of each briefly.	**07**
	(b)	Describe the main difference in the approach of k-means and kmedoids Algorithm with a neat diagram.	**07**

OR

Q.4	**(a)**	Explain the Apriori algorithm for association rule learning with an example.	**07**
	(b)	You are given a set of one-dimensional data points: {5, 10, 15, 20, 25, 30, 35}. Assume that k = 2 and first set of random centroid is selected as {15, 32} and then it is refined with {12, 30}.	**07**

        1. Create two clusters with each set of centroid mentioned above following the k-means approach.
        2. Calculate the SSE for each set of centroid.

Q.5	**(a)**	Explain in detail Back propagation Neural network.	**07**
	(b)	Write a detail note on learning process in Artificial Neural Network.	**07**

OR

Q.5	**(a)**	Differentiate biological neuron and artificial neuron.	**07**
	(b)	Explain, in details, the process of evaluating the performance of a classification model. Explain the different parameters of measurement.	**07**

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