Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3170924 Date:14-12-2023

Subject Name: AI and Machine Learning

Time: 10:30 AM TO 01:00 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.**

			Marks
Q.1	**(a)**	Briefly describe characteristics of Artificial Intelligence.	**03**
	(b)	Define Artificial Intelligence. Give comparison of different intelligent systems based on their application.	**04**
	(c)	With the help of a flow chart explaining the procedure of the Genetic Algorithm.	**07**
Q.2	**(a)**	How learning rate of ANN affect the convergence?	**03**
	(b)	Explain Supervised learning and Unsupervised learning.	**04**
	(c)	Express various structures of ANN.	**07**
		OR	
	(c)	What is deep learning? How it will be different from Machine learning? Also, explain the importance of deep learning by real time application example.	**07**
Q.3	**(a)**	Define the following: (i) Reinforcement Learning (ii) Deep Learning (iii) Semi-supervised Learning	**03**
	(b)	What is Machine Learning? Explain the steps to develop a machine learning application.	**04**
	(c)	Describe the working principle of the Support Vector Machine with diagrams.	**07**
		OR	
Q.3	**(a)**	List the methods to avoid over-fitting.	**03**
	(b)	Describe how principal component analysis is carried out to reduce the dimensionally of data sets.	**04**
	(c)	Explain the Classification of Regression with its real time applications.	**07**
Q.4	**(a)**	Define following terms with respect to K-Nearest neighbor learning: a) Regression b) Residual c) Kernel Function	**03**
	(b)	Distinguish between Linear regression and Logistic regression using a suitable example.	**04**
	(c)	What are the issues in Decision tree learning? How to overcome them?	**07**
		OR	

Q.4	**(a)**	What do you mean by Clustering?	**03**
	(b)	Explain the Fuzzy IF-THEN rule along with the fuzzy inference system.	**04**
	(c)	What do you mean by Defuzzification? Explain any two Defuzzification methods.	**07**
Q.5	**(a)**	Brief reinforcement learning.	**03**
	(b)	Explain the Back propagation algorithm in brief.	**04**
	(c)	Describe Fuzzy compliment, Union, and intersection by using any suitable example.	**07**

OR

Q.5	**(a)**	Differentiate between Semi supervised learning and Active learning.	**03**
	(b)	Explain any one crossover technique with an example.	**04**
	(c)	Discuss economic generation scheduling using a genetic algorithm.	**07**

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