Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
ME – SEMESTER – III (New) • EXAMINATION – WINTER - 2020

Subject Code: 3730506 **Date:02/01/2021**
Subject Name: Pattern Recognition and Machine learning
Time: 10:30 AM TO 12:30 PM **Total Marks: 56**
Instructions:
  1. **Attempt any FOUR questions out of EIGHT questions.**
  2. **Make suitable assumptions wherever necessary.**
  3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Classify neural network in to major types of architectures used and explain them in brief.	**07**
	(b)	What are the uses of Linear discriminator functions? Explain in brief Support Vector Machines along with necessary details as Linear discriminator function.	**07**
Q.2	**(a)**	Explain Bayesian decision theory for continuous features with two category classification.	**07**
	(b)	Explain the discriminant function for the normal density for all three special cases.	**07**
Q.3	**(a)**	When do Maximum Likelihood and Bayes method differ?	**07**
	(b)	Explain the over fitting and computational complexity issues associated with dimensionality problems.	**07**
Q.4	**(a)**	Explain the first order Hidden Markov model with computation and evaluation.	**07**
	(b)	Explain Bayesian Belief Network with example	**07**
Q.5	**(a)**	Explain in brief the necessary steps for back propagation learning algorithm. Clearly mentions all assumptions made	**07**
	(b)	Describe in brief following heuristics to improve the performance of Back propagation algorithm. • Learning rates • Normalization of input data .	**07**
Q.6	**(a)**	Explain different types of activation functions used for neural network training.	**07**
	(b)	Describe in brief following heuristics to improve the performance of Back propagation algorithm. • Sequential vs. batch update • Learning from hints	**07**
Q.7	**(a)**	Clearly explain furniture purchase problem with necessary data assumption	**07**

(b) Draw and explain in brief following neural learning algorithms. **07**
(a) Supervised learning (b) unsupervised learning

Q.8 **(a)** Explain basic ART network architecture and also explain its ability to resolve **07** stability –plasticity dilemma.

(b) List names of Dynamic neural architectures. Explain any one of them in brief. **07**

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