

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII EXAMINATION – SUMMER 2025****Subject Code:3171613****Date:27-05-2025****Subject Name:Pattern Recognition****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.

		MARKS
Q.1	(a) Calculate probability of getting 3 on both dice if we throw two dice of six surface together.	03
	(b) Write and explain bays equation.	04
	(c) Draw various type of decision boundary for two features product classification in two classes.	07
Q.2	(a) What is eigen values and eigen vectors?	03
	(b) Explain bayes decision theory for two class and single feature problem/product.	04
	(c) Derive minimum risk classifier equation.	07
	OR	
	(c) Find eigen values and eigen vectors for matrix $A = \begin{bmatrix} 2 & 5 \\ 4 & 7 \end{bmatrix}$	07
Q.3	(a) What is features dimensionality reduction?	03
	(b) How Image face recognition is done using PCA.	04
	(c) Explain LDA method of feature reduction.	07
	OR	
Q.3	(a) What are the various application of markov model ?	03
	(b) Explain first order markov model with example.	04
	(c) Which are different distance measuring method for objects in two dimension feature space?	07
Q.4	(a) What is difference between classification and clustering?	03
	(b) Write steps of K-mean clustering algorithm.	04
	(c) Explain feed forward neural network.	07
	OR	
Q.4	(a) What is unsupervised learning?	03
	(b) Explain steps for divisive hierarchical algorithm.	04
	(c) Draw ANN structure for 5 input features, 2 hidden layer and 8 different category classification problem.	07
Q.5	(a) Explain support vector for classification of data in two class.	03
	(b) What is difference between RNN and LSTM.	04
	(c) Explain various type pooling functionality in CNN with example.	07
	OR	
Q.5	(a) What is application of Decision tree?	03
	(b) Explain K- nearest neighbor algorithm.	04
	(c) What is Gini index ? Explain its role in construction process of CART.	07
