Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

Course Code: EC467

Course Name: PATTERN RECOGNITION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) Explain the various applications of pattern recognition systems. (5)

b) Obtain the discriminant function for Bayes classifier if the feature vector distribution is Gaussian with different means and a fixed diagonal covariance matrix. (10)

2 a) Explain the Bayesian parameter estimation technique. (8)

b) Describe the significance of Gaussian mixture models in classifier design. (7)

3 a) For a two category Bayes classifier, the loss function is given by $\lambda_{11}=0.1$, $\lambda_{21} = 1$, $\lambda_{12}=1$, $\lambda_{22} = 0.2$. The categories are equally likely. Obtain the decision rule. (5)

b) Explain Fisher discriminant analysis for dimensionality reduction. (10)

PART B

Answer any two full questions, each carries 15 marks.

4 a) Explain K Nearest Neighbour method for density estimation. (10)

b) Explain the perceptron model for classification. (5)

5 a) Explain support vector machines and how it achieves maximum margin classification. (10)

b) Define overfitting and its drawback. (5)

6 a) Define the various impurity measures used in test selection while constructing a decision tree. (8)

b) Explain gradient descent algorithm and state perceptron convergence theorem. (7)

PART C

Answer any two full questions, each carries 20 marks.

7 a) What is bagging approach in ensemble classifier? (7)

b) Explain the classification capabilities of a two layer perceptron with necessary illustrations. (8)

	c)	Draw and explain the structure of a multilayer feed forward network.	(5)
8	a)	Explain the back propagation algorithm and its network architecture.	(10)
	b)	List and describe the different types of clustering.	(5)
	c)	What is a dendogram? How is it useful for clustering?	(5)
9	a)	Explain the K-means clustering algorithm.	(10)
	b)	Define the problem of cluster validity.	(5)
	c)	Write the major steps involved in agglomerative hierarchical clustering.	(5)

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