



PRESIDENCY UNIVERSITY

BENGALURU

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End - Term Examinations - MAY /JUNE 2026

Date: 22-05-2026

Time: 01:00pm – 04:00pm

School: SOIS	Program: BCA-AIML/DS	
Course Code: CSA3052	Course Name: PATTERN RECOGNITION	
Semester: VI	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05	C06
Marks	12	12	24	14	26	12

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	What is a feature in Pattern Recognition?	2 Marks	L1	C01
2.	Give an example of a linear discriminant function.	2 Marks	L1	C01
3.	State any two advantages of dimensionality reduction.	2 Marks	L1	C02
4.	What is the role of eigenvalues in KL transformation?	2 Marks	L2	C02
5.	Define posterior probability.	2 Marks	L2	C03
6.	Mention two applications of Bayesian Inference.	2 Marks	L1	C03
7.	Write two advantages of Naive Bayes Classifier.	2 Marks	L2	C04
8.	Why are linear discriminants important in Pattern Recognition?	2 Marks	L2	C05
9.	State the perceptron learning rule.	2 Marks	L1	C05
10.	What is Sum of Error Estimate?	2 Marks	L1	C06

Part B

Answer the Questions.

Total Marks 80M

11.	a.	Discuss the role of Pattern Recognition in areas such as medical diagnosis, speech recognition, image analysis, and biometrics.	10 Marks	L2	C01
	b.	Elaborate the concepts of supervised, unsupervised, and semi-supervised learning with suitable examples.	10 Marks	L3	C01
Or					
12.	a.	Explain prior probability, posterior probability, likelihood, and evidence with suitable examples.	10 Marks	L2	C01
	b.	Elucidate Gaussian Probability Density Function (PDF) and its importance in Pattern Recognition.	10 Marks	L2	C01

13.	a.	Discuss the concept of basis vectors and their role in vector representation with suitable examples.	10 Marks	L2	C02
	b.	Derive the steps involved in Karhunen-Loève (KL) transformation for dimensionality reduction.	10 Marks	L3	C02
Or					
14.	a.	Explain Singular Value Decomposition (SVD) in detail with mathematical formulation.	10 Marks	L2	C03
	b.	Describe the principle of statistical independence in ICA (Independent Component Analysis) with suitable examples.	10 Marks	L2	C03

15.	a.	Discuss the steps involved in Maximum Likelihood Parameter Estimation and illustrate them with a suitable example.	10 Marks	L3	C03
	b.	Explain Maximum a Posteriori (MAP) estimation with mathematical expression.	10 Marks	L3	C04
Or					
16.	a.	Summarize the concept of Maximum Entropy Estimation in detail.	10 Marks	L2	C04
	b.	Explain the working of Naive Bayes Classifier in a weather prediction problem.	10 Marks	L3	C04

17.	a.	Discuss the geometric interpretation of decision hyperplanes in Pattern Recognition.	10 Marks	L2	C05
	b.	Illustrate the working of Perceptron Algorithm for a two-class pattern classification.	10 Marks	L3	C05
Or					
18.	a.	Explain the Mean Square Error (MSE) criterion used in Pattern Recognition.	10 Marks	L3	C06
	b.	Describe the concept of Sum of Error Estimate and its importance in pattern classification.	10 Marks	L3	C06