



QP CODE: 25047693



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Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, NOVEMBER 2025

Third Semester

M Sc Artificial Intelligence

Core Course - AI010303 - PATTERN RECOGNITION

2020 ADMISSION ONWARDS

C2895F63

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Explain any one application of pattern recognition.
2. What is issue of generalization?
3. Define the loss function for minimum error rate classification.
4. Define bayes decision theorem for discrete features.
5. Define Class-Conditional Densities in bayesian estimation.
6. What does Window density mean.
7. What is the difference between bagging and boosting algorithms.
8. Compare Cross validation and m-fold cross validation.
9. With neat diagram define dendrogram.
10. What do you mean by Low-Dimensional Representations?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Explain in detail about the working of pattern classifier.
12. What is the impact of Noise and Overfitting in pattern classification?
13. How Bayes Theorem is used for Two-Category Classification?
14. Explain Discriminant Functions for the Normal Density for $\Sigma_i = \sigma^2 I$
15. Explain Hidden Markov model and its role in the classifier design.





16. Explain the convergence of parzen window.
17. Explain Bias and variance for classification.
18. Apply K-means clustering algorithm on given data for $K=3$. Use $C1(2)$, $C2(16)$, $C3(38)$ as initial cluster centres. Data : 2,4,6,3,31,12,15,16,38,35,14,21,23,25,30.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight **5** each.

19. Explain in detail about various learning methods.
20. Discuss Discriminant Functions for the Normal Density.
21. Explain the general principle of the maximum likelihood estimation for the following cases 1. Unknown mean and known covariance matrix 2. Unknown mean and unknown covariance matrix.
22. Explain different criterion functions for Clustering.

(2×5=10 weightage)

