PAPER ID-410529

Subject Code: KCA033

Roll No: | | | | | | | | | | | | | |

MCA
(SEM IV) THEORY EXAMINATION 2023-24
PATTERN RECOGNITION

TIME: 3 HRS **M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably

SECTION A

1. Attempt *all* questions in brief.

a.	Define the term pattern recognition. List any two of its application areas.	2
b.	Define the term Probability with example.	2
c.	What are three main types of Classifiers?	2
d.	Define the terms Sampling and Quantization.	2
e.	Why linear discriminant function is used?	2
f.	Discuss Dimension Reduction in short.	2
g.	Define Membership Function.	2
h.	What do you understand by Non-Parametric Techniques of Pattern Recognition? Name any three techniques.	2
i.	Write short note on Non-Hierarchical Clustering.	2
j.	Explain the concept of criteria functions for clustering in short.	2

SECTION B

2. Attempt any *three* of the following:

a.	Compare Supervised and Unsupervised learning techniques with suitable examples.	10
b.	Illustrate statistical and syntactic pattern recognition (SPR) approach.	10
c.	Write a short note on first order Hidden Markov Model. How does a Hidden Markov Model is different from Markov Model?	10
d.	Discuss nearest neighbor algorithm in detail.	10
e.	Write short notes on: Cluster Validation and Iterative Square Technique of clustering.	10

SECTION C

3. Attempt any *one* part of the following:

a.	Explain Multivariate Normal Density using mathematical notations.	10
b.	Explain perceptron algorithm in detail.	10

4. Attempt any *one* part of the following:

a.	State Bayes theorem and discuss how Bayesian classifier works.	10
b.	Prove that a Bayes Classifier is equivalent to minimum distance classifier, assuming that the feature vector is Gaussian.	10

5. Attempt any *one* part of the following:

a.	Write short notes on: Curse of dimensionality and Expectation Maximization.	10
b.	What is the significance of Hidden Markov Model in classifier design?	10

6. Attempt any *one* part of the following:

a.	Compare Parzen Window based method and k nearest neighbor-based method for Probability density function estimation.	10
b.	What do you mean by linearly separable classification problem? Give example.	10

7. Attempt any *one* part of the following:

a.	Differentiate between agglomerative and divisive clustering techniques.	10
b.	Describe any one real world pattern recognition system based on unsupervised learning methodology.	10