# MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL (A constituent unit of MAHE, Manipal)

## II SEMESTER M.TECH.(DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING) END SEMESTER EXAMINATIONS, MAY/JUNE 2023

#### **SUBJECT: PATTERN CLASSIFICATION (CSE - 5006)**

#### **REVISED CREDIT SYSTEM**

## (29/05/2023)

Time: 9:30 am to 12:30 pm

MAX.MARKS: 50

## **INSTRUCTIONS TO CANDIDATES:-**

- Answer **ALL** the questions.
- Missing data may be suitable assumed.



	$\begin{array}{c} \frac{p(x \omega_1)}{p(x \omega_2)} \\ \theta_b \\ \theta_a \end{array}$	
	$\mathcal{R}_{2}$ $\mathcal{R}_{1}$ $\mathcal{R}_{2}$ $\mathcal{R}_{1}$ $x$	
	Graph 2	
3A.	Derive the equation for the direct generalization of the multivariate normal case where the covariance matrix and mean is unknown.	4M
3B.	Summarize the basic assumptions for the Bayesian approach where the unknown density can be parameterized.	3M
3C.	Discuss the source of classification error for maximum likelihood and Bayes method.	3M
4A.	In the non-parametric technique, outline the conditions required to estimate the density function.	3M
4B.	Derive the equations for asymptotic nearest neighbour error rate in K-nearest neighbour approach.	4M
4C.	Discuss the computational complexity of the nearest neighbour algorithm in space and time complexity and what algorithmic techniques is used to reduce the computational complexity in nearest neighbour search.	3M
5A.	Describe the process involved in finding the hyper plane with the largest margin in Support Vector Machine.	4M
5B.	Describe with the neat diagram the architecture of a probabilistic neural network. Illustrate with an example.	4M
5C.	Illustrate with an example Fuzzy Classification.	2M