GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

RN19002003

Registration No:

Total Number of Pages :1 **M.TECH**

M.TECH 3rd SEMESTER REGULAR EXAMINATIONS, NOV / DEC 2019

MECPE3012 – Pattern Recognition and Machine Learning

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks : 70**

PART-A **(10 X 2=20 MARKS)**

1. Answer the following questions.

a) Explain Design Principles of Pattern Recognition System.
b) Sketch a block diagram to represent a Pattern Recognition system.
c) State and explain Bayes formula.
d) Explain K-Nearest Neighbor Estimation
e) Explain nearest neighbour algorith with example.
f) What do you understand by supervised learning and unsupervised learning?
g) Define Adaptive System and Generalization
h) Define with a neat sketch Signum & Sigmoidal function
i) Derive the expression of boundary error
j) Explain agglomerative hierarchical clustering algorithm with example

PART-B **(5 X 10=50 MARKS)**

Answer any five questions from the following.

2.a	What is Bay's Theorem. Discuss Bay's Classifier using suitable example in detail.	**5**
b	Enumerate the resulting risk involved, in replacing the deterministic function $\alpha(x)$ with a randomized rule, viz., the probability $P(\alpha_i/x)$ of taking action α_i upon observing x.	**5**
3.a	Explain in detail the design parameters to be adopted for ANN with relevant example?	**5**
b	Explain the relevant topologies for (a) Nonrecurrent and (b) Recurrent Networks and distinguish between them.	**5**
4.a	Explain the concept of Probabilistic Neural Network with the help of a algorithm.	**5**
b	Explain Principal Component Analysis as applicable to Dimension Reduction	**5**
5.a	Explain the Ugly Ducking theorem.	**5**
b	Derive the expression of resampling for estimating statistics.	**5**
6.a	Exlpain K-means clustering algortihm with suitable example	**5**
b	Explain the process of Cluster validation with relevant example.	**5**
7.a	Describe the following with suitable example: (a) Normal Density Function (b) Utility Theory	**5**
b	Describe the significance in pattern recognition with suitable example: (a) Mean and Covariance (b) Chi Square Test	**5**
8.	Write short notes on	
a	support vector machines	**5**
b	Parametric vs. Non-parametric pattern recognition methods.	**5**

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