

B.TECH.**THEORY EXAMINATION (SEM-VIII) 2016-17
PATTERN RECOGNITION****Time : 3 Hours****Max. Marks : 100****Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.****SECTION – A****1. Explain the following:****10 x 2 = 20**

- (a) Differentiate Classification with Clustering.
- (b) What do you mean by pattern recognition? Explain.
- (c) What is Learning? Discuss Supervised & Un Supervised Learning.
- (d) Discuss Reinforcement Learning.
- (e) What is Back Propagation Algorithm?
- (f) Discuss Normal Density Function.
- (g) Discuss Cluster Validation.
- (h) What is Conditional Probability?
- (i) Discuss various Pattern Recognition Approaches.
- (j) Discuss Agglomerative Clustering.

SECTION – B**2. Attempt any five parts of the following questions:****5 x 10 = 50**

- (a) Discuss the Design Process of the Pattern Recognition System with suitable block diagram.
- (b) What is Bay's Theorem? Explain. Also discuss Bay's Classifier using some example in detail.
- (c) What do you mean by Clustering? Explain. Discuss K-means clustering algorithm with suitable example.
- (d) What is a Discriminant Function? In a two class problem, the likelihood ratio is given as follows: $P(X|C_1) / P(X|C_2)$. Write the discriminant function in terms of the likelihood ratio.
- (e) What do you mean by Dimension Reduction? Discuss Principal Component Analysis (PCA) algorithm for dimension reduction.
- (f) What do you mean by Fuzzy Decision making? Also discuss the Fuzzy Classification using suitable example.
- (g) Write an algorithm for K-Nearest Neighbor Estimation. Explain.
- (h) Explain the following and discuss their significance in Pattern Recognition with suitable example :
 - (i) Mean and Covariance
 - (ii) Chi Square Test.

SECTION – C**Attempt any two parts of the following questions:****2 x 15 = 30**

- 3 What is Bayesian Decision Theory? Discuss Two Class Category Classification in detail.
- 4 What is Hidden Markov Model (HMM)? Explain following in HMM:
 - (i) Forward Algorithm
 - (ii) Backward Algorithm.

5 Write a short note on the following:

- (i) Parametric vs. Non-Parametric Pattern Recognition methods.
- (ii) Parzen Windows
- (iii) Bayesian estimation