

Indian Statistical Institute, Bangalore Centre

M.S. (QMS) First Year

Second Semester - Pattern Recognition

Final Exam

Duration: 180 minutes

Date: 27-04-2016

Maximum Marks: 50

Note: Answer For any 50 marks

1. State and derive the back error propagation algorithm for multi-layer perceptron. [6]
2. What is principal components, and how it is used to reduce dimensions of a data set? [6]
3. Describe the Branch and Bound Feature selection method with an example of selecting TWO optimum features out of SIX features. [6]
4. Explain the K-nearest neighbour decision rule for pattern classification. Point out the advantages and disadvantages in using this rule. [6]
5. [4+4+4]
 - a. What is a clustering problem and its mathematical formulation?
 - b. Write the K-means and DBSCAN clustering algorithms.
 - c. Discuss their advantages and disadvantages over each other.
6. What is Bayes decision rule? Derive the mathematical formulation of classification errors with Bayes decision rule. [2+6]
7. What are generalization and over-fitting, and their relations? Discuss the effect of these factors in pattern classification problems. [3+3]
8. Describe the motivations of standardization and normalization of data sets? Give at least one method of performing these operations. [3+3]