

BE Computer Engineering (Semester II, Elective – III)
410450 Pattern Recognition (2008 Pattern)

SECTION – I

- Q 1. (a) Describe the basic modules in designing a pattern recognition system. [08]
(b) Define Pattern recognition. State various applications of pattern recognition. [08]
- OR**
- Q 2. (a) Explain following terms with example: [08]
i) Feature ii) Feature vector
iii) Pattern iv) Classification
(b) Compare supervised and unsupervised pattern recognition [08]
- Q3. (a) Define minimum error rate classification. Explain probability density function with proper argument. [08]
(b) Explain how Bayesian can help for multi-classification problem with suitable example. [08]
- OR**
- Q4. (a) What is the role of dimension reduction in pattern recognition? State and explain different methods. [08]
(b) Explain Bayes criterion, and Least square method in detail. [08]
- Q5. (a) Discuss Expectation maximization method used for parameter estimation. [08]
(b) Explain mixture model (Gaussian) for density estimation? What are advantages of Gaussian mixture model over other estimation? [10]
- OR**
- Q6. (a) What are different desirable properties of Maximum likelihood estimation method? [08]
(b) Explain Bayesian estimation techniques for density estimation. What are advantages of Bayesian estimation over other estimation? [10]

SECTION – II

- Q7. (a) How Hidden Markov model is useful to solve well known coin-tossing? Explain. [08]
(b) Define within-class scatter matrix & between-class scatter matrix. Discuss the discriminate analysis for 2-class problem. [08]
- OR**
- Q8. (a) Discuss Fisher Linear Discriminate analysis for the problem of projecting data samples from d-dimensions onto a line. [08]
(b) What is mean by Context- dependent classification? Explain Discrete HiddenMarkov Model and continues density hidden Markov. [08]
- Q9. Write notes on any two: [16]
I. Parzen-window method
II. Nearest neighbor approach for multi category classification
III. Perceptron
- OR**
- Q 10 Explain any two: [16]
I. Difference between parametric and non parametric density estimation
II. Kernel density estimation
III. Linear Support vector machine
- Q11. (a) Explain decision tree? How can you measure the information gain from a decision tree? [08]
(b) What is pattern clustering? What are the basic steps that an expert must follow in order to develop a clustering task? [10]
- OR**
- Q 12 (a) What is the difference between classification and clustering? State and explain cluster validation and cluster analysis [10]
(b) Explain Hierarchical clustering with different linkage metrics. [08]