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06CS/IS664

Sixth Semester B.E. Degree Examination, June 2012
Pattern Recognition

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Draw and explain the diagram of the components of a typical pattern recognition system. (10 Marks)
b. Define the following:
i) Model choice
ii) Training
iii) Supervised learning
iv) Unsupervised learning
v) Reinforcement learning. (10 Marks)
- 2 a. Explain how to incorporate risk factor in decision theory, related to generalized Baye's decision theory. Consider a two class case. (10 Marks)
b. Evolve an expression for the linear discriminant function for the normal density with the features statistically independent and features having the same variance σ^2 . (10 Marks)
- 3 a. Discuss how maximum likelihood can be applied to the following cases:
i) Gaussian case: unknown μ .
ii) Gaussian case: unknown μ and Σ . (10 Marks)
b. Explain in detail the evaluation and decoding problem of hidden Markov model. (10 Marks)
- 4 a. Explain in detail how the Parzen-Window method can be implemented as a neural network. (10 Marks)
b. Explain in detail the computational complexity of the K-nearest-neighbor rule. (10 Marks)

PART – B

- 5 a. Explain in detail the minimum squared-error procedures. (10 Marks)
b. Explain in detail the following of Ho-Kashyap procedures.
i) The descent procedure; ii) Convergence proof. (10 Marks)
- 6 a. Explain in detail the stochastic simulated annealing and deterministic simulated annealing. (10 Marks)
b. Explain the evolutionary method of classification. (10 Marks)
- 7 a. What is pruning? Explain the assignment of leaf node labels with examples. (10 Marks)
b. What is bottom up parsing? (05 Marks)
c. Explain Naïve string matching algorithm. (05 Marks)
- 8 a. Explain in detail k-means clustering. (10 Marks)
b. Explain in detail the scatter criteria criterion functions for clustering. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.