

Total No. of Questions :12]

SEAT No. :

P858

[Total No. of Pages : 2

[4659]-237

B.E. (Computer Engineering)

a-PATTERN RECOGNITION

(2008 Pattern)(Semester-II) (Elective-III)

Time : 3 Hours]

[Max. Marks : 100

- Instructions : 1) Answer any 3 questions from each section.*
2) Answers to the two sections should be written in separate books.
3) Neat diagrams must be drawn wherever necessary.
4) Black figures to the right indicate full marks.
5) Assume suitable data, if necessary.

SECTION-I

- Q1)** a) Explain features and feature vectors with suitable example? How feature vector is useful for pattern recognition? [8]
b) What are the issues in design of pattern recognition system? How feature extraction is important for pattern recognition? [8]

OR

- Q2)** a) What do you mean by patterns? How segmentation and grouping is important components of pattern recognition system? [8]
b) Explain learning and adaption methods in pattern recognition system.[8]

- Q3)** a) Explain Bayesian decision theory with example in detail. [10]
b) Explain Feature space, Loss function, Risk, and Bayes risk in brief. [8]

OR

- Q4)** a) What is the problem of Minimum - Error -rate classification? Explain in detail. [10]
b) Explain decision hyperplanes and perceptron with suitable examples.[8]

- Q5)** a) When does maximum- Likelihood and Bayes methods differ? Explain in detail. [8]
b) Explain recursive Bayes incremental learning method with example. [8]

OR

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- Q6)** a) Explain Bayes Error, model error and Estimation error in detail. [8]
b) What are sample covariance, and absolutely unbiased estimator? Explain in detail. [8]

SECTION -II

- Q7)** a) Explain how Hidden Markov Model (HMM) is effective to solve the problem of multiple decision? [8]
b) What is Overfitting problem? Explain in detail with suitable example. [8]

OR

- Q8)** a) What is problem of finding the best direction? Explain how scatter matrix is useful to solve this problem. [8]
b) Explain any one classical approach to find effective linear transformation in detail. [8]
- Q9)** a) Explain non parametric technique for directly estimating the posterior probabilities in brief. [10]
b) Explain the steps involved in SVM training, in brief. [8]

OR

- Q10)** a) Explain Quadratic and polynomial discriminant function in detail. [10]
b) Explain batch perceptron algorithm for finding a solution vector in brief. [8]
- Q11)** a) Explain k-Means and fuzzy k- Means clustering algorithm in detail. [8]
b) Explain the difference in Pruning and joining with proper example. [8]

OR

- Q12)** a) Justify the significance of Root node, Descendent and Subtree in a classification problem using decision tree with suitable example. [8]
b) Show that the computational complexity of k-Means clustering algorithm is $O(ndcT)$, Where n is the number of d -dimensional patterns, c is the assumed number of clusters, and T is the number of iterations. [8]

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