Total No. of Questions : 12]

SEAT No. :

P1812

[Total No. of Pages :3

[4859]-215

B.E. (Computer Engineering)

a-PATTERN RECOGNITION

(2008 Course) (Elective-III) (Semester-II) (410450)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

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) ***Figures to the right indicate full marks.***
5) ***Assume suitable data, if necessary.***

SECTION-I

Q1) a) Define pattern recognition ? State and explain different approaches for pattern recognition. **[8]**

b) State and explain different available supervised pattern recognition methods and explain any one. **[8]**

OR

Q2) a) Explain with example following terms: **[8]**

i) Feature ii) Pattern iii) Classification iv) Feature Vector.

b) Explain in brief various state of the art pattern recognition applications?**[8]**

Q3) a) Explain Bayesian classifier and bays criterion function for defining risk for decision making. **[8]**

b) Three machines A, B, C produce respectively 60%, 30%, and 10% of the total number of items of a factory. The percentages of respective defective outputs of these machines are respectively 2%, 3% and 4%. An item is selected at random and is found to be defective. Find the probability that the item was produced by machine C? **[8]**

OR

P.T.O.

Q4) a) Explain Bayes minimum error rate classifier with example. **[8]**

b) What is linear discriminant function and decision hyper plane? Explain in brief. **[8]**

Q5) a) What is parametric estimation? Explain any one parametric estimation method. **[8]**

b) What are sample covariance, and absolutely unbiased estimator? Explain in detail. **[10]**

OR

Q6) a) Discuss maximum Likelihood approach used for parameter estimation. **[8]**

b) Explain Gaussian mixturemodel for density estimation with the advantages of Gaussian mixture model over other estimation? .**[10]**

SECTION-II

Q7) a) How Hidden Markov model is useful to solve well known coin-tossing (two coins) problem? **[8]**

b) What is Overfitting problem? Explain in detail with suitable example. **[8]**

OR

Q8) a) What is mean by Context-dependent classification? Explain Discrete Hidden Markov Model and continues density hidden Markov model. **[8]**

b) Define and explain within-class scatter matrix & between-class scatter matrix. **[8]**

Q9) a) Explain what is the difference between parametric and non parametric density estimation. **[8]**

b) Explain the steps involved nearest neighbour approach for multi category classification. **[8]**

OR

Q10)a) Explain batch perceptron algorithm for finding a solution vector in brief. **[8]**

b) Explain non parametric technique for directly estimating the posteriori probabilities in brief. .**[8]**

Q11)a) What do you mean by a decision tree? Explain its importance in pattern classification. **[10]**

b) Justify the significance of Nominal data in a classification problem with suitable example. .**[8]**

OR

Q12)a) Explain the process of clustering. State and explain various techniques used for clustering. **[10]**

b) What are the basic steps that an expert must follow in order to develop a classification task? **[8]**

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