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(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID :110754 | Roll No. | | | | | | | | | |

B.Tech.

(SEM. VII) THEORY EXAMINATION, 2015-16

PATTERN RECOGNITION

[Time:3 hours] **[MaximumMarks:100**

Section-A

Q.1 **Attempt all parts. All parts carry equal marks. Write answer of each part in short.** (2×10=20)

(a) Write the difference between classification and clustering.

(b) If A, B, C are three mutual exclusive and exhaustive events and P(B)=1/3 P(A), P(C)=1/2 P(A), find P(A), P(B) and P(C).

(c) Two cards are drawn from a full packet of 52 cards, the first card being returned to the packet before the second is drawn. Find the probability that these two cards are of the same suit.

(d) What is the difference between parametic and non parametric pattrern recogintion methods?

(e) What is the probability of obtaining 9, 10, and 11 points with 3 dice?

(f) How do we evaluate the performance of a classifier?

(g) What do you mean by fuzzy decision making? Also discuss the fuzzy classificaton using suitable example.

(h) Write difference between learning and adaption?

(i) Discuss mean and covariance with an example.

(j) Name the differnt methods of non-parameter estimation strategies. What are the main differences between them?

Section-B

Note: Attempt <u>any five</u> questions from this section.

Q2. What is a discriminant function? discuss it in detail. In a two class problem, the likelihood rtio is given as follows:p(x/C1)p(x/C2). Write the discriminant function in terms of the likelihood ratio.

Q3. What do you mean by fuzzy decision making? Also discuss the fuzzy classification using suitable example.

Q4. Prove that the mean and the standard deviation ot the binomial distribution are np and $\sqrt{}$ npq respectively.

Q5. In an experiment on the immunization of goats from a disease, the following results were obtained:

	Died or disease	Survived	Total
Calculated	2	10	12
with vaccine Not inoculated	6	6	12
Total	8	16	24

Q6. What is dimension reduction? Discuss Principal Component Analysis (PCA) algorithm for dimension reduction.

Q7. Estimate a density function using a symmetric triangular kernel with a base width of 2, given that your samples are at 2, 3, 3, and 4. Explain with diagram.

Q8. Wow the k-nearest neighbor method works? Explain with KNN estimation and KNN rule.

Q9. Explain the concept of expectation maximization with the help of an algorithm.

Section-C

Note: Attempt any two questions from this section.

(15×2=30)

Q10.(a) What is Hidden Markov Model (HMM)? Explain following in HMM

(i) Forward algorithm

(ii) Backward algorithm

(b) What is normal distribution? Explain.

Q11. Explain sum of squared error criterion and related minimum variance criteria for clustering? Discuss what kind of clustering problems are suited to sum-of-squared criterion.

Q12. Write short notes on:

a) Chi-square test

b) K-means partition algorithm

c) Clustering

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