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Max. Marks: 70

B.Tech IV Year II Semester (R13) Regular & Supplementary Examinations April 2018 **PATTERN RECOGNITION & APPLICATION**

(Electronics and Communication Engineering)

Time: 3 hours

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
 - (a) List any three applications of pattern recognition.
 - (b) What are the basic steps in pattern recognition?
 - (c) On which Bayesian Decision theory is based?
 - (d) Explain symmetrical or zero-one loss function.
 - (e) List the two issues that come up for the classification accuracy with respect to dimensionality.
 - (f) Explain Rayleigh distribution along with their sufficient statistics.
 - (g) Explain a Discriminant function.
 - (h) What is the difference between Ho-Kashyap and modified Ho-Kashyap algorithm?
 - (i) List any two applications of HMM.
 - (j) Explain the sum-of-squared error criterion for clustering.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Explain the following terms associated with pattern recognition: (i) Sensing. (ii) Segmentation and grouping (along with flow chart). (iii) Mereology.

OR

3 Explain the concepts of supervised learning, unsupervised learning and reinforcement learning using suitable examples.

UNIT – II

4 Explain the importance of Bayesian decision theory in pattern recognition problems by taking proper examples.

OR

5 Explain how the action of a linear transformation on the feature space will convert an arbitrary normal distribution into another normal distribution.

UNIT – III

6 Explain how density estimation is useful in Non parametric pattern classification.

OR

7 Explain the conjunction rule of fuzzy classification and give the Cox-Jaynes axioms. List the four limitations of fuzzy classification technique.

UNIT – IV

8 Explain in detail about back propagation algorithm with respect to network learning, training protocols and learning curves.

OR

9 Show for the Widrow-Hoff or LMS rule that: if $\eta(k) = \eta(1)/k$, then the sequence of weight vectors converges to a limiting vector "a" satisfying Y^t (Y_a - b) = 0.

UNIT – V

10 Explain Graph-theoretic method of unsupervised classification using neat diagrams.

OR

11 Explain the forward-backward algorithm of HMM along with the equations relating to estimates.

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