R13

Code: 13A04805

B.Tech IV Year II Semester (R13) Regular & Supplementary Examinations April 2018
PATTERN RECOGNITION & APPLICATION
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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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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