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Question Paper Code: ACS014



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech VI Semester End Examinations (Regular) - May, 2019

Regulation: IARE – R16

MACHINE LEARNING

Time: 3 Hours

(CSE)

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. (a) How is candidate elimination algorithm different from Find-S algorithm? [7M]
 (b) The following Table 1 containing student exam performance data [7M]

Table 1

No.	Student	First last year?	Male?	Works hard?	Drinks?	First this year?
1	Richard	yes	yes	no	yes	yes
2	Alan	yes	yes	yes	no	yes
3	Alison	no	no	yes	no	yes
4	Jeff	no	yes	no	yes	no
5	Gail	yes	no	yes	yes	yes
6	Simon	no	yes	yes	yes	no

Calculate the entropy and construct a decision tree based on the minimal entropy.

2. (a) Identify the suitable problems and their characteristics for decision tree learning. [7M]
 (b) Analyze the use of entropy and information gain for constructing the decision tree and tabulate the ID3 algorithm. [7M]

UNIT – II

3. (a) What is linearly inseparable problem? How to solve XOR function by using SVM. [7M]
 (b) What is a perceptron? Design a two layer network of perceptron to implement A XOR B. [7M]

4. (a) Compare and contrast the following [7M]
 i. Sequential and batch training
 ii. Mini-batches and Stochastic Gradient Descent.
 (b) Suppose that the following are a set of points in two classes:
 class 1 : 11
 21
 class 2 : 00
 10
 01
 Plot them and find the optimal separating line. [7M]

UNIT – III

5. (a) Explain the concept of Bayes theorem with an example. Describe Bayesian networks in detail. [7M]
 (b) Describe maximum likelihood hypothesis for predicting probabilities. [7M]
 6. (a) Describe variance. Explain the concept of Bias-Variance tradeoff. [7M]
 (b) Differentiate variance and bias variance trade off. Discuss in detail about the Bayes optimal classifier. [7M]

UNIT – IV

7. (a) What is genetic algorithm? Describe the evolutionary learning genetic algorithm. [7M]
 (b) Find the eigenvalues and eigenvectors of the matrix $A = \begin{pmatrix} 1 & -3 & 3 \\ 3 & -5 & 3 \\ 6 & -6 & 4 \end{pmatrix}$. [7M]
 8. (a) What is the general principle of an ensemble method and what is bagging and boosting in ensemble method? [7M]
 (b) Differentiate LDA and PCA. Write a short note on linear discriminant analysis(LDA). [7M]

UNIT – V

9. (a) A major problem with the single link algorithm is that clusters consisting of long chains may be created. Describe and illustrate this concept. [7M]
 (b) Write the algorithm for k means clustering and compute 2 clusters when given a dataset point as {2, 4, 10, 12, 3, 20, 30, 11, 25}. [7M]
 10. (a) Discuss in detail about partitional algorithms and minimum spanning tree. [7M]
 (b) The squared error clustering algorithm minimizes the squared error. Justify? [7M]

