Total No. of printed pages = 3

ECE 1818 OE 31

21/6/vr

Roll No. of candidate

2022

B.Tech 8th Semester End-Term Examination

ECE + ETE

MACHINE LEARNING

(New Regulation 2017-2018 &
New Syllabus 2018-2019)

Full Marks – 70   Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer Question No.1 and any four from the rest.

1.   Answer the following questions : $(10 \times 1 = 10)$

   (i) The disadvantage of decision tree is

   (a) Robust to outliers   (b) Prone to be overfit

   (c) Used for factor analysis   (d) None of the above

   (ii) The following is not a supervised learning

   (a) PCA   (b) Naïve Bayesian

   (c) Linear Regression   (d) Decision Tree

   (iii) An algorithm that automatically categorizes data into one or more set of classes

   (a) Classifier   (b) Identifier

   (c) Recogniser   (d) Detectors

   (iv) Cross-Validation is a statistical method of evaluating and comparing learning algorithms by dividing data

   (a) Into one class   (b) Into two segments

   (c) Into three segments   (d) Into four segments

[Turn over

(v) The clustring algorithm that merges and splits nodes to modify nonoptimal partitions

    (a) K-means clustering   (b) Conceptual clustering

    (c) Agglomerative clustering   (d) All of the above

(vi) Regression trees are used to model

    (a) Linear data   (b) Nonlinear data

    (c) Categorical data   (d) None of the above

(vii) Supervised learning and unsupervised clustering both requires at least one

    (a) Input attribute   (b) Output attribute

    (c) Hidden attribute   (d) Categorical attribute

(viii) Regrading the bias and variance which of the following statements are true

    (a) Models which overfit have a high variance

    (b) Models which overtit have a low variance

    (c) Models which underfit have a high bias

    (d) Models which underfit have a low bias

(ix) While using gradient descent, which of the following statements are correct

    (a) Using a high learning rate can lead to slow convergence

    (b) Using a high learning rate can result in the model cot converging

    (c) If the cost function has multiple local minima, the initialization decides which local minima is reached

    (d) Adjusting the learning rate is an effective way to reach the global minima in case the cost function has multiple local minima .

(x) Back propagation means

    (a) It is another name given to the curvy function in the perceptron

    (b) It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn

    (c) It is another name given to the curvy function in the perceptron

    (d) None of the above

2. (a) Define machine learning. Explain with specific examples. (5)

  (b) Distinguish between supervised learning and unsupervised learning. Illustrate with an example. (6)

  (c) Discuss any four examples of machine learning applications. (4)

3. (a) Explain Inductive bias. Explain Inductive bias in decision tree learning. (8)

  (b) Discuss the issues of avoiding the over fitting the data, handling the continuous data and in missing values in decision trees. (7)

ECE 1818 OE 31   2

4. (a) Briefly explain about different Probabilistic Models in Machine Learning? (5)

   (b) What is Baye's Theorem? How it is useful in machine learning context? (5)

   (c) Explain how Support Vector Machine can be used for classification of linearly separable data. (5)

5. (a) What is a Perceptron? Explain the working of a perception with a neat diagram. (5)

   (b) Define artificial neural networks. Explain biological learning systems. (5)

   (c) Describe the characteristics of back propagation algorithm. (5)

6. (a) Write a short note on Linear Discriminant Analysis (LDA). (5)

   (b) Describe the random forest algorithm to improve classifier accuracy. (5)

   (c) What do you mean by Reinforcement learning? How reinforcement learning. problem differs from other function approximation tasks? (5)

7. (a) Illustrate K means clustering algorithm with an example. (8)

   (b) Explain the EM algorithm. (7)

ECE 1818 OE 31   3