Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– V EXAMINATION – WINTER - 2018

Subject Code: 3650014 **Date: 28/11/ 2018**

Subject Name: Machine Learning

Time: 10:30 am to 01:30 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 (a) Answer the following

1	False Negative	**2**
2	Over-fitting	**2**
3	Entropy	**2**

Q.1 (b) Do as directed **8**

1 Suppose you want to apply AdaBoost algorithm on Data D which has T observations. You set half the data for training and half for testing initially. Now you want to increase the number of data points for training T1, T2 … Tn where T1 < T2…. Tn-1 < Tn. **Identify the Correct option from the ones given below. Give reason for your answer.**

A) The difference between training error and test error increases as number of observations increases

B) The difference between training error and test error decreases as number of observations increases

C) The difference between training error and test error will not change

D) None of These

2 Which of the following algorithm are not an example of ensemble learning?Give reason for your answer.

A) Random Forest B) Adaboost C) Extra Trees D) Gradient Boosting E) Decision Trees

3 Cross validation can be used to select the number of iterations in boosting; this procedure may help reduce overfitting. Give reason for your answer.

A) TRUE B) FALSE

4 Which of the following will be true about k in k-NN in terms of variance? Why?

A) When you increase the k, the variance will increase

B) When you decrease the k, the variance will increase

C) Cannot say

D) None of the above

Q.2 **Answer the following**

	A	Describe K-nearest neighbour algorithm. Why is it known as instance-based Learning?	**7**
	B	What is Information Gain? Write down and discuss Inductive Decision Tree (ID3) algorithm	**7**
		OR	
	B	What is Inductive bias? How does it affect the Decision Tree Algorithms? Give suitable example.	**7**

Q.3 **Answer the following**

	A	What is Cost function in Back Propagation? Discuss Back propagation algorithm.	**7**
	B	What is a Neural Network (NN)? With an example, discuss most suitable NN application.	**7**
		OR	
Q.3	**A**	How does a Multi-Layer Perceptron (MLP) improve classification? Write and discuss MLP algorithm.	**7**
	B	What is Bayesian Learning? List 4& discuss one application suitable for Naïve-Bayes.	**7**

Q.4 **Answer the following**

	A	Discuss Bayes Optimal Classifier with an example. Discuss the role of MAP Hypothesis.	**7**
	B	Differentiate: Supervised Learning V/S Unsupervised Learning.	**7**
		OR	
Q.4	**A**	Write and explain Gibbs Algorithm with suitable example	**7**
	B	What is Maximum Likelihood? How does it affect the Predicting probability? Give suitable example.	**7**

Q.5 **Answer the following**

	A	Are True Positive and True Negative enough for accurate Classification? If only False Negative is reduced, does it lead to skewed classification? Give reasons for your answers.	**7**
	B	Discuss Recommender System with reference to Machine Learning. Give an example where recommender system is more useful.	**7**

OR

Q.5	**A**	What is Random Forest (RF)? Discuss reasons that improve RF based classification compared to ID3	**7**
	B	Why Support Vector Machines (SVM) Classifiers have improved classification over Linear ones? Discuss HyperPlane in SVM.	**7**

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