Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– V EXAMINATION – WINTER 2019

Subject Code: 3650014 **Date: 19/11/2019**

Subject Name: Machine Learning

Time: 10:30 AM TO 01:00 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 questions. **07**

1) When we can say a hypothesis h is consistent?
2) Why overfitting happens?
3) What is inductive machine learning?
4) When should we have to use classification over regression?
5) What is cross validation?
6) Write a popular application of machine learning that you see on day-to-day basis.
7) What is the standard approach to supervised learning?

(b) Write a detail note on perspectives and issues in Machine Learning. **07**

Q.2 **(a)** Find the version space form the following data set for concept learning using Candidate Elimination algorithm. **07**

Size	Color	Shape	Label
Big	Red	Circle	No
Small	Red	Triangle	No
Small	Red	Circle	Yes
Big	Blue	Circle	No
Small	Blue	Circle	Yes

(b) Is there any effect on classification due to bias? Justify your answer with suitable example. **07**

OR

(b) Occam's razor prefers the simplest hypothesis that fits the data. Discuss the view followed with justification in detail. **07**

Q.3 **(a)** Explain Maximum Likelihood and Least squared Error Hypothesis in detail. **07**

(b) Identify and discuss the problem characteristic for which Artificial Neural Network learning technique is more appropriate. **07**

OR

Q.3 **(a)** Describe under fitting and over fitting problem in Machine Learning. **07**

(b) Illuminate the Bayesian Belief Network with suitable example in detail. **07**

Q.4 **(a)** Explain working of back propagation algorithm for multilayer feed forward network. **07**

(b) The following dataset will be used to learn a decision tree for predicting whether a person is Happy(H) or Sad (S) on the color of their shoes, whether they wear a wig and the number of ears they have.

Color	Wig	Number of Ears	Emotions (Output)
G	Y	2	S
G	N	2	S
G	N	2	S
B	N	2	S
B	N	2	H
R	N	2	H
R	N	2	H
R	N	2	H
R	Y	3	H

1) What is H (Emotion | Wig=Y)? **01**
2) Which attribute would the decision-tree building algorithm choose to use for the root of the tree (assume no pruning)? **03**
3) Draw the full decision tree that would be learned for this data (assume no pruning). **03**

OR

Q.4 **(a)** How Naïve Bayes algorithm useful for learning and classifying text?Explain in detail. **07**

(b) A company is produces tissues, which are used by the batteries, say working in biological science. The Objective of company's business objective here is to predict how well their clients accept types of tissue they are producing. **07**

Following is the data set result after survey from client on company produce different types of tissues.

Name	Acid Durability	Strength	Class
Type - 1	7	7	Bad
Type - 2	7	4	Bad
Type – 3	3	4	Good
Type – 4	1	4	Good

Company want to predict class for Type – 5 tissue having acid durability = 3 and strength = 7 based on existing survey result data set.

What will be the prediction class for Type – 5 using kNN algorithm when k=1, 2 and 3?

Q.5 **(a)** Write a detail note on any one proposed Recommender System that depictsuse of Machine Learning. **07**

(b) Distinguish Lazy Learner and Eager Learner in detail. **07**

OR

Q.5 **(a)** What is Gibbs Algorithm? Describe its suitability in Machine Learning in detail. **07**

(b) Assume there are dual sided two coins and describe EM algorithm by considering these two coins. **07**

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