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Printed pages: 2 **Sub Code: MTCS031**

Paper Id 210201 **Roll No.**

M. TECH.

(SEM-II) THEORY EXAMINATION 2017-18
MACHINE LEARNING

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a. What are the applications of machine learning?
b. What is Machine learning? When to use it?
c. List the differences between supervised and unsupervised learning?
d. Give the example of classification problem.
e. What is linear regression?
f. What are the Matrix multiplication properties?
g. What is meant by decision boundary? What is non linear decision boundary?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a. What are neural network? Explain its working with the help of an example.
b. Explain dimensionality reduction as an unsupervised learning. Explain PCA.
c. Write short note on K-means algorithm.
d. Explain the types of learning along with their characteristics.
e. What is data compression? Explain data compression techniques

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain PCA algorithm. What are the applications of PCA
(b) How a high accuracy learning system can be designed? Explain.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain how error analysis in Machine learning takes place.
(b) Write a short note on anomaly detection in machine learning? What are its application areas?

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain collaborative filtering algorithm in detail.
(b) Explain how to deal with big datasets? Also state high bias problem.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) What is online learning? Explain how machine learning is related to online

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learning? What are its applications?

(b) Write short note on Artificial data synthesis.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain how a ROC curve works. Define precision and recall

(b) Why is "Naive" Bayes naive? Explain the difference between L1 and L2 regularization.

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