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Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Supplementary Examination June 2022 (2015 Scheme)

Course Code: CS467
Course Name: MACHINE LEARNING

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 4 marks.   Marks

1	List out different types of regression models	(4)
2	Describe reinforcement learning with example	(4)
3	Explain feature selection and feature extraction method for dimensionality reduction.	(4)
4	Define precision, recall, sensitivity and specificity.	(4)
5	Compare the true positive rates and false positive rates in machine learning.	(4)
6	Define Baye's theorem and discuss about its terminologies	(4)
7	State linearly separable problem? Give an example dataset for linearly separable. Find an example for a dataset which is not linearly separable.	(4)
8	Compare bagging and boosting	(4)
9	Identify 4 measures used for finding the distance between numerical data points	(4)
10	What is a dendrogram? Give an example.	(4)

PART B
Answer any two full questions, each carries 9 marks.

11   a)   Describe the basic components of the machine learning process.   (9)

12   a)   Find a reason for the importance of generalization in a machine learning and discuss the reason for the poor performance of a ML algorithm in terms of data.   (4)

     b)   Discuss any five examples of machine learning applications.   (5)

13   a)   Find the covariance matrix of the given table   (6)

Features	Sample 1	Sample 2	Sample 3	Sample 4
X1	4	8	13	7
X2	11	4	5	14

     b)   Is principal component analysis a supervised learning problem? Justify your answer   (3)

PART C
Answer any two full questions, each carries 9 marks.

14 a) There are 10 balls (6 white and 4 red balls) in a box and let it be required to pick   (5)
up the red balls from them. Suppose we pick up 7 balls as the red balls of which
only 2 are actually red balls. What are the values of precision and recall in
picking red ball?

b) Describe the uses of MLE. Identify any 2 special cases in MLE   (4)

15 a) Summarize the ID3 algorithm for learning decision trees with an example   (9)

16 a) Identify the benefits of decision tree pruning? Also mention the different types   (5)
of pruning methods.

b) Discuss gradient descent method. Discover the use of gradient descent method in   (4)
the backpropagation algorithm.

PART D
Answer any two full questions, each carries 12 marks.

17 a) Examine a Hidden Markov Model with an example   (7)

b) Discuss about ensemble learning   (5)

18 a) Outline EM algorithm. Find out the relation of MLE with EM   (7)

b) Describe any 2 applications of k-means clustering   (5)

19 a) Describe an algorithm for agglomerative hierarchical clustering.   (6)

b) What is DIANA (DIvisive ANAlysis) and discuss the algorithm

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