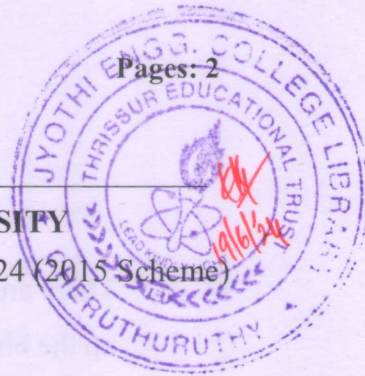Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (S, FE) / S7 (PT) (S,FE) Examination May/June 2024 (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 applications of machine learning   (4)

2   Describe reinforcement learning with example   (4)

3   Compare feature selection and feature extraction methods for dimensionality reduction.   (4)

4   State and explain precision and recall.   (4)

5   Compare the true positive rates and false positive rates in machine learning.   (4)

6   Describe common methods used for resampling   (4)

7   State linearly separable problem. Give an example dataset for linearly separable. Illustrate a dataset which is not linearly separable.   (4)

8   Why do we prefer to combine many learners together?   (4)

9   List out any methods used for finding the distance between numerical data points   (4)

10   Identify the applications of Hidden Markov Model.   (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)   What is the importance of generalization in a machine learning and find a reason for the poor performance of a ML algorithm in terms of data.   (4)

     b)   Discuss any two regression models.   (5)

13   a)   Find the covariance matrix of the given table   (5)

Features	Sample 1	Sample 2	Sample 3	Sample 4
Score	68	60	58	40
Age	29	26	20	35

     b)   Describe the procedure for principal component analysis   (4)

PART C

Answer any two full questions, each carries 9 marks.

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

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

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

16 a) Explain the backpropagation algorithm   (5)

    b) Discuss about the gradient descent method.   (4)

PART D

Answer any two full questions, each carries 12 marks.

17 a) Illustrate ML Hidden Markov Model with an example   (7)

    b) Discuss about ensemble learning   (5)

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

    b) List out the applications of k-means clustering   (5)

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

    b) What is DBSCAN and and provide the algorithm for it.   (6)

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