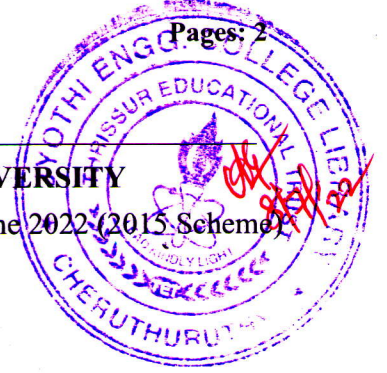


Reg No.: \_\_\_\_\_

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 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? (5)
- 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 of pruning methods. (5)
- b) Discuss gradient descent method. Discover the use of gradient descent method in the backpropagation algorithm. (4)

**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 (6)

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