(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2023 ONLY) **23UAI411**

REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI
END-OF-SEMESTER EXAMINATIONS : MAY 2025

B.Sc Computer Science with AI & ML(SF) **MAXIMUM MARKS: 75**
SEMESTER : IV **TIME : 3 HOURS**

PART - III

23UAI411 – Introduction To Machine Learning

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1. What is the primary goal of Machine Learning?
   a) To create rules for manual decision-making
   b) To enable systems to learn from data and improve over time
   c) To develop programming languages for AI systems
   d) To reduce the cost of programming
2. Which of the following is a technique used to prevent overfitting in linear regression?
   a) Boosting Aggregation
   b) Bootstrapped Aggregating
   c) Bagging Aggregation
   d) Bagging Algorithms
3. In Decision Trees, what is the main criterion used to split the data at each node?
   a) Information Gain
   b) Euclidean Distance
   c) Mean Squared Error
   d) R-squared
4. Which of the following is a primary advantage of using K-Means clustering for unsupervised learning?
   a) It handles large datasets efficiently.
   b) It works well with both labeled and unlabeled data.
   c) It identifies non-linear relationships.
   d) It doesn't require any predefined number of clusters.
5. Which of the following is the primary goal of Association Rule Learning (ARL)?
   a) To classify data into specific categories
   b) To predict future values based on historical data
   c) To discover interesting relations or patterns in large datasets
   d) To reduce the dimensionality of the dataset

Ethical Paper

(CONTD …. 2)

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES (K2)

6. List any two applications of Machine Learning.

7. What is the difference between Simple Linear Regression and Multiple Linear Regression?

8. Brief the role of hyperparameters in Decision Trees.

9. What does the DBSCAN algorithm stand for in the context of clustering?

10. Give short notes on Apriori Algorithm.

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Discuss the key components involved in designing a learning system.

(OR)

b) Explain the various types of Machine Learning.

12. a) Detail about the concept of Lasso Regression and how does it differ from Ridge Regression?

(OR)

b) Write about the process of evaluating regression models.

13. a) What are Random Forests, and how do they improve over individual Decision Trees?

(OR)

b) Write in detail about the Support Vector Machine (SVM) and its applications in regression.

14. a) Explain Dimensionality Reduction and provide one example of its application.

(OR)

b) Explain in detail the K-Means clustering algorithm and how it works.

15. a) Elaborate the key concepts involved in Association Rule Learning (ARL).

(OR)

b) Illustrate the Eclat algorithm for Association Rule Learning and how it works.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K4 (Or) K5)

16. a) Describe some popular tools used in Machine Learning.

(OR)

b) Explain how does machine learning differ from traditional programming.

17. a) Write in detail about the Bagging method and its purpose in Ensemble learning.

(OR)

b) What are the challenges in model selection for regression models and how can they be addressed?

18. a) Explain common evaluation metrics for classification and regression tasks.

(OR)

b) Compare Decision Trees and Random Forests in terms of model complexity and performance.

19. a) Elaborate the Density-Based Spatial Clustering of Applications with Noise (DBSCAN)
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(OR)

b) Discuss the challenges faced in clustering tasks.

20. a) Illustrate the process of generating association rules from frequent itemsets in ARL.

(OR)

b) Illustrate are the limitations of Association Rule Learning?

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