KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(4 Pages) **Reg. No:……**

Question Code: 26E00813 **Course Code: 24PSMA41**

PG Degree - End Semester Examinations, April 2026

Fourth Semester

M.Sc., MATHEMATICS

Introduction to Machine Learning and Applications

(For those who joined in July 2024 onwards)

Time : 3Hours **Maximum : 75 Marks**

PART – A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

CO:1 K:2 1. Infer the correct answer: Machine learning is a subset of

(a) Deep learning (b) Artificial intelligence

(c) Neural networks (d) Robotics

CO:1 K:1 2. Which of the following model is derived from machine learning algorithms

(a) Offline model (b) Online model

(c) Analytical model (d) Predictive model

CO:2 K:1 3. What is the main characteristic of big data?

(a) Small volume (b) Structured only

(c) Large volume, high velocity and variety (d) Simple storage

CO:2 K:2 4. Infer which one of the following type of big data analysis is used to find patterns in historical data

(a) Descriptive analytics (b) Predictive analytics

(c) Prescriptive analytics (d) Operational analytics

CO:3 K:1 5. Which type of analytics helps anticipate changes based on understanding the patterns and anomalies with in that data.

(a) Descriptive analytics (b) Diagnostic analytics

(c) Predictive analytics (d) Prescriptive analytics

CO:3 K:2 6. Outline which statement best explains how classical statistical analysis influences data mining and machine learning algorithms

(a) They are completely unrelated fields

(b) Many machine learning and data mining algorithms are based on classical statistical methods

(c) Statistical analysis only applies to small data sets not to data mining

(d) Data mining replaces the need for statistics

CO:4 K:2 7. The main goal of applying machine learning to large data sets is:

(a) To clean data

(b) To improve predictive model accuracy

(c) To reduce storage space

(d) To replace data visualization

CO:4 K:1 8. Which of the following statement correctly describe reinforcement learning?

(a) A type of supervised learning

(b) A clustering technique

(c) A data storage method

(d) A behavioral learning model

CO:5 K:2 9. Deep learning is especially useful when we are trying to learn patterns from _____

(a) Statistical data

(b) Analytical data

(c) Structured data

(d) Unstructured data

CO:5 K:1 10. To gain benefit from a massive amount of unstructured data, it is important to understand

(a) Source of data

(b) Manipulation of the data

(c) Reliability of the data sources

(d) All the above

PART – B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

CO:1 K:4 11. (a) Examine how the definition of machine learning applies to real-world applications such as recommendation systems.

(OR)

(b) Analyze why machine learning is needed in business.

CO:2 K:3 12. (a) Construct a definition for big data and describe its key characteristics.

(OR)

(b) Make use of data cleaning and preprocessing techniques to build trust in data used for machine learning and big data applications.

CO:3 K:4 13. (a) Identify the central theme of using statistics in machine learning and explain its importance.

(OR)

(b) Discuss how data mining techniques help machine learning algorithms identify patterns in large data sets.

CO:4 K:3 14. (a) Identify the role of training data size in causing overfitting and suggest solution.

(OR)

(b) Apply reinforcement learning to a robot navigation task and explain how it would learn to avoid obstacles efficiently.

CO:5 K:4 15. (a) What is the relationship between neural networks and deep learning?

(OR)

(b) What strategies can help data scientists discover valuable insights while implementing their first machine learning models.

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 600 words.

CO:1 K:5 16. (a) Estimate the role of iterative learning from data in improving the performance of models in machine learning.

(OR)

(b) Evaluate the sustainability of machine learning as a technology.

CO:2 K:6 17. (a) Develop a strategy to integrate Big-data technologies with machine learning to solve a large-scale data analysis problem.

(OR)

(b) Discuss the role and importance of Hybrid cloud.

CO:3 K:3: 18. (a) Model the two main approaches to advanced analytics and explain how they differ in handling data.

(OR)

(b) Explain the role of reasoning, natural language processing and planning in AI and how it helps in decision making.

CO:4 K:5 19. (a) Explain what unsupervised data is in machine learning and describe its role in training an unsupervised learning model.

(OR)

(b) In your opinion, which supervised learning algorithm is most effective for image recognition and why?

CO:5 K:6 20. (a) How can data scientists formulate an unbiased strategy by leveraging machine learning techniques?

(OR)

(b) Discuss how having more data can make planning and decision-making more accurate in machine learning.