



Term Evaluation (Even) Semester Examination March 2025

Roll no.....

Name of the Course: MBA

Semester: 4

Name of the Paper: Artificial Intelligence & Machine Learning for Business Management

Paper Code: MB401 (BA)

Time: 1.5 hour

Maximum Marks: 50

Note:

- (i) This question paper contains two Sections - A and B
- (ii) Both Sections are compulsory
- (iii) Answer any two sub questions from a, b & c in each main question of Section A. Each sub question carries 5 marks.
- (iv) Section B, consisting of a case study, is compulsory. It is of 20 Marks.

Section A

Q1.

(2X5 = 10 Marks)

- a. Define Knowledge Representation in the context of Artificial Intelligence. Discuss the various techniques used for representing knowledge and explain its importance in solving AI-related problems. (CO1)
- b. What are the key components of the Knowledge Discovery in Databases (KDD) process model? Describe each component in detail with examples of how they contribute to the development of a machine learning system. (CO1)
- c. Differentiate between Machine Learning and Data Science by highlighting their objectives, methodologies, and applications. Provide suitable examples to justify your answer. (CO1)

Q2.

(2X5 = 10 Marks)

- a. Explain the working of Artificial Neural Networks (ANNs) with a suitable example. Discuss their architecture, learning process, and practical applications in solving complex problems. (CO2)
- b. How does Reinforcement Learning differ from Supervised Learning? Provide a detailed explanation along with a real-world example to illustrate the differences in their learning paradigms and practical use cases. (CO2)
- c. What are the major challenges and issues faced in the field of Machine Learning? Discuss aspects such as data quality, overfitting, interpretability, and ethical concerns. (CO2)

Q3.

(2X5 = 10 Marks)

- a. Explain the concept of Linear Regression in detail and discuss its significance in predictive modeling. Provide mathematical formulations and an example demonstrating its application in a business scenario. (CO3)
- b. What is Multivariate Regression? Explain how it differs from simple linear regression and discuss a real-world example where multivariate regression is applied for decision-making. (CO3)
- c. Discuss the importance of model evaluation in supervised learning. Explain different evaluation metrics such as Mean Squared Error, R-squared, and Classification Accuracy, and their significance in assessing the model's performance. (CO3)

Section B

Q4. Case Study

(20 Marks)

A retail company wants to optimize its marketing strategies using AI and Machine Learning. The company has a large volume of customer data, including purchase history, browsing behavior, demographic information, and feedback. The company aims to enhance customer engagement, predict future sales trends,



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and optimize pricing strategies to maximize profits.

- How can supervised learning be used to improve customer segmentation? Explain the advantages of using classification algorithms such as Decision Trees, K-Nearest Neighbors, and Support Vector Machines for this purpose. (CO4)
- Suggest an appropriate regression technique to predict future sales based on past trends. Justify your choice by comparing different regression techniques such as Linear Regression, Non-Linear Regression, and Polynomial Regression. (CO3)
- What machine learning techniques can be applied to optimize pricing strategies? Discuss the use of techniques such as reinforcement learning and clustering in price optimization. Provide examples from the retail industry. (CO5)
- Identify potential challenges the company might face in implementing ML-based solutions. Discuss aspects such as data privacy, computational complexity, model interpretability, and ethical considerations in deploying AI-driven strategies. (CO5)

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