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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (R) Examinations April 2026 (2024 Scheme)

Course Code PECCT413
Course Name: INTRODUCTION TO AI AND ML

Max. Marks: 60 Duration: 2 hours 30 minutes

PART A

(Answer all questions. Each question carries 3 marks)

		CO	Marks
1	A robot explores every room in a building one by one without knowing where the target object is located. Identify whether this is informed or uninformed search. Justify your answer.	CO1	(3)
2	Discuss Propositional Logic and First-Order Logic with suitable examples.	CO1	(3)
3	Explain Linear Regression with the equation of a straight line and explain the significance of slope and intercept.	CO2	(3)
4	A dataset contains actual values: 5, 10, 15 and predicted values: 6, 9, 14. Compute the Mean Squared Error (MSE), Mean Absolute Error (MAE), and Root Mean Squared Error (RMSE).	CO2	(3)
5	Define weights and bias in an Artificial Neural Network and explain their importance.	CO3	(3)
6	Explain the working of the Multilayer Feed Forward Neural Network (MLFFNN) with a neat diagram. Also explain the features of MLFFNN.	CO3	(3)
7	Explain the function of forget gate in LSTM.	CO4	(3)
8	Explain the application of Artificial Intelligence (AI) in Intrusion Detection Systems (IDS).	CO5	(3)

PART B

(Answer any one full question from each module, each question carries 9 marks)

Module -1

9	a)	Define an Intelligent Agent. Explain its working with a neat model diagram.	CO1	(3)
	b)	Discuss any three types of intelligent agents with neat diagrams and suitable real-world examples.	CO1	(6)

10	a)	Illustrate and explain the steps involved in the machine learning pipeline for building an effective model from raw data to final evaluation.	CO1	(9)

Module -2

11	a)	Explain the K-Nearest Neighbors (KNN) algorithm in detail with a neat schematic diagram. Describe the working steps of KNN and explain how distance is calculated using suitable formulas. Also list any two advantages and three limitations of the KNN algorithm.	CO2	(9)
12	a)	Describe the Principal Component Analysis (PCA) algorithm. Explain the steps involved in performing PCA.	CO2	(9)

Module -3

13	a)	Explain the Perceptron model used in Artificial Neural Networks. Discuss its architecture, working principle, and learning algorithm.	CO3	(9)
14	a)	Explain the Backpropagation algorithm used in neural networks. Discuss its working with suitable diagrams.	CO3	(9)

Module -4

15	a)	Explain the architecture of Recurrent Neural Networks (RNNs). Discuss its working principle and types of RNN architectures.	CO4	(9)
16	a)	Discuss the ethical considerations in Artificial Intelligence and Machine Learning, including bias, fairness, explainability, and societal impact.	CO4	(9)

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