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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S) Examinations (FT/WP) May 2026 (2024 Scheme)

Course Code: GNEST305
Course Name: INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Max. Marks: 60 Duration: 2 hours 30 minutes

PART A

(Answer all questions. Each question carries 3 marks)

			CO	Marks
1		What is an artificial neuron?Describe the basic structure with a diagram	CO1	(3)
2		What is the role of model-based and instance-based learning	CO1	(3)
3		What are eigen values and eigen vectors	CO2	(3)
4		Explain any 4 application of PCA	CO2	(3)
5		Compare correlation and regression	CO3	(3)
6		What is the principle of least squares?How is it used in linear regression?	CO3	(3)
7		Why should we learn Data science?	CO4	(3)
8		Discuss the significance of statistics for data science.	CO4	(3)

PART B

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

Module -1

9	a)	A K-Means clustering task is to be performed manually on the following 2D data points:Q1=(3,9),Q2(2,3),Q3(6,2),Q4(7,6),Q5(4,7) and Q6=(5,3). The initial centroids are given as C1=(2,10) and C2=(5,4).Perform one complete iteration of the K-Means algorithm.	CO1	(5)
	b)	What is a Multi-Layer Perceptron?describe its architecture	CO1	(4)
10	a)	What are supervised and unsupervised learning methods?	CO1	(3)
	b)	Explain the different types of Activation function in ANN	CO1	(6)

Module -2

11	a)	What is linear algebra?Write the applications of linear algebra in details.	CO2	(5)
	b)	Define the term "dimensionality reduction" and explain why it is needed in AIand datascience.	CO2	(4)

12	a)	What is Principal Component Analysis (PCA) and Spectral Decomposition?	CO2	(5)
	b)	Perform the Singular Value Decomposition (SVD) of a matrix Given [4,1] [1,4]	CO2	(4)

Module -3

13	a)	Explain maximum likelihood Estimator in detail with necessary steps.	CO3	(5)
	b)	Explain the Least square method in detail.	CO3	(4)
14	a)	Distinguish between covariance and Karl Pearson's correlation coefficient.	CO3	(3)
	b)	Explain all probability the distribution in detail	CO3	(6)

Module -4

15	a)	What are the applications of machine learning in data science?	CO4	(3)
	b)	Describe how machine learning contributes to business forecasting.	CO4	(6)
16	a)	What are the important steps of data processing?Explain in details	CO4	(5)
	b)	Differentiate between Traditional data analysis and Big data analysis	CO4	(4)

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