Reg. No.																

Question Paper Code	14314

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Third Semester

Artificial Intelligence and Data Science

20AIPC302 - FUNDAMENTALS OF MACHINE LEARNING TECHNIQUES

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	In healthcare, what type of machine learning technique is often used for predicting patient readmissions? (a) Classification algorithms (b) Regression models (c) Clustering algorithms (d) Dimensionality reduction techniques	1	K1	CO1
2.	What is the term for the numerical value received by the agent after taking an action in reinforcement learning? (a) State (b) Policy (c) Reward (d) Action	1	K1	CO1
3.	Which type of data represents values with meaningful numeric magnitudes, such as age or salary? (a) Categorical data (b) Numerical data (c) Text data (d) Time series data	1	K1	CO2
4.	Which of the following is a common issue in data quality that involves having incomplete or missing values? (a) Outliers (b) Data drift (c) Missing data (d) Noise	1	K1	CO2
5.	Feature ___ involves transforming a given set of input features to generate a new set of more powerful features. (a) Selection (b) Engineering (c) Transformation (d) Re-engineering	1	K1	CO3
6.	The new features created in PCA are known as (a) Principal components (b) Eigenvectors (c) Secondary components (d) None of the above	1	K1	CO3
7.	This is essentially finding a relationship (or) association between the dependent variable (Y) and the independent variables (X). (a) Slope (b) Regression (c) Classification (d) Categorization	1	K1	CO4
8.	_____ is the extension of the simple linear model by raising (squaring) each of the original predictors to a power. (a) Multiple Linear Regression (b) Simple Linear Regression (c) Polynomial Regression (d) Ridge Regression	1	K1	CO4
9.	_____ clustering algorithm is based on the concept of centroids? (a) K-Means (b) DBSCAN (c) Agglomerative (d) Mean-Shift	1	K1	CO5
10.	Bagging stands for Bootstrap _____. (a) Aggregating (b) Aggressive (c) Algorithm (d) Averaging	1	K1	CO4

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	What is mean by Machine learning?	2	K1	CO1
12.	Distinguish between traditional programming and ML programming.	2	K2	CO1
13.	Give the hierarchical structure of data types available.	2	K1	CO2
14.	Differentiate Supervised and Unsupervised Machine Learning.	2	K2	CO2
15.	List any three weaknesses of the decision tree method.	2	K1	CO3
16.	What is Feature Engineering?	2	K1	CO3
17.	How will you handle the Outliers in a Regression Model?	2	K2	CO4

18.	Define Multi-collinearity.		2	K1	CO4
19.	What is Clustering?		2	K1	CO5
20.	What is unsupervised learning?		2	K1	CO5
21.	List out the Partitioning methods that are involved in the Clustering Process.		2	K1	CO6
22.	Difference between Ensemble learning and instance based learning.		2	K2	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain in detail about the types of machine learning with necessary diagrams	11	K2	CO1
		OR			
	b)	Discuss in detail about reinforcement learning with relevant Examples.	11	K2	CO1
24.	a)	Explain in detail about the basic types of data in machine learning.	11	K2	CO2
		OR			
	b)	Describe the different methods involved in training the predictive model.	11	K2	CO2
25.	a)	Discuss in detail about the feature engineering with an example.	11	K2	CO3
		OR			
	b)	Discuss about the decision tree algorithms and briefly discuss the entropy and information gain.	11	K2	CO3
26.	a)	Illustrate simple linear regression using a graph explaining slope and intercept also Explain rise, run, and slope in a graph.	11	K3	CO4
		OR			
	b)	Demonstrate polynomial regression model in detail with an example.	11	K3	CO4
27.	a)	List out the broad three categories of clustering techniques? Explain the characteristics of each briefly.	11	K2	CO5
		OR			
	b)	Explain the apriori algorithm for association rule learning with an example.	11	K2	CO5
28.	a)	Examine about the representation learning in detail.	11	K3	CO6
		OR			
	b)	Illustrate how ensemble learning works with real dataset.	11	K3	CO6