CBCS SCHEME

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BDS602

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Artificial Intelligence and Machine Learning

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Define Artificial Intelligence. Explain four categories of AI.	8	L1	CO1
	b.	Explain PEAS description of the task environments for automated Taxi?	8	L2	CO1
	c.	Explain the concept of Rationality.	4	L2	CO1
		OR			
Q.2	a.	Define the followings in your own words : (i) Intelligence (ii) Artificial Intelligence (iii) Agent (iv) Rationality (v) Logical reasoning	10	L1	CO1
	b.	List and explain types of agents with neat diagram.	10	L3	CO1
		Module – 2			
Q.3	a.	Explain the need of problem solving agent.	4	L2	CO2
	b.	Define a problem with its components.	6	L1	CO2
	c.	Explain the example problems or well known problems in problem solving approach in details.	10	L2	CO2
		OR			
Q.4	a.	Explain Tree-Search and Graph Search for soluation with algorithms.	10	L2	CO2
	b.	What are the ways to measuring problem solving performance? Explain.	4	L1	CO2
	c.	Explain the followings: (i) BFS → Breadth first search (ii) DFS → Depth first search (iii) Bidirection search	6	L2	CO2
		Module – 3			
Q.5	a.	Define machine learning and explain need of machine learning.	6	L1	CO3
	b.	Explain types of machine learning in details.	6	L2	CO3
	c.	Define Data. Explain types of data.	4	L2	CO3

	d.	Explain Big Data Analytics frame work.	4	L2	CO3
		OR			
Q.6	a.	Explain the various steps involved in the machine learning process.	6	L2	CO3
	b.	Define Datasets. Explain different data types in machine learning.	4	L1	CO3
	c.	Explain different types of charts in Data visualization.	4	L2	CO3
	d.	Consider the following set $S = \{12, 14, 19, 22, 24, 26, 28, 31, 34\}$. Apply various binning techniques and show the results.	6	L4	CO3
		Module – 4			
Q.7	a.	What is the difference between covariance and correlation?	6	L2	CO4
	b.	Solve the following set of equations using Gaussian elimination methods $2x_1 + 4x_2 = 6$ $4x_1 + 3x_2 = 7$	6	L4	CO4
	c.	What is hypothesis? Explain the procedure for hypothesis test.	4	L1	CO4
	d.	Explain the various steps involved in principle component analysis.	4	L2	CO4
		OR			
Q.8	a.	Explain essential mathematics for multivariate data in machine learning.	6	L2	CO4
	b.	Define Learning system. Also explain Design of learning system.	6	L1	CO4
	c.	Difference between Instance Based learning and model based learning.	4	L3	CO4
	d.	Explain Nearest neighbor learning.	4	L2	CO4
		Module – 5			
Q.9	a.	Define Artificial Neural Network and also explain the structure of ANN.	6	L1	CO5
	b.	Explain the difference between Biological Neurons and Artificial Neural Networks.	6	L3	CO5
	c.	Explain advantage, limitations and challenges of Artificial Neural Networks.	8	L2	CO5
		OR			
Q.10	a.	Define Perceptron. Explain perceptron model with diagram.	6	L1	CO5
	b.	What is Activation function? Explain different activation functions in ANN.	10	L1	CO5
	c.	Explain Radial basis function neural network.	4	L2	CO5

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