M.E. / M.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

First Semester

M.E - Computer Science and Engineering

(Common to M.E. - Computer Science and Engineering (with Specialization in Networks))

20PCSPW101 - ADVANCED MACHINE LEARNING WITH LABORATORY

Regulations - 2020

Duration: 3 Hours   Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO
1.	Describe Concept learning as a Search problem.	2	K1	CO1
2.	Discuss briefly about the types of Machine Learning.	2	K2	CO1
3.	Give description about Radial Basis Functions.	2	K2	CO2
4.	Elaborate the types of Back propagation.	2	K2	CO2
5.	Justify the need for learning in classification.	2	K2	CO3
6.	Define Vector Quantization.	2	K1	CO3
7.	Discuss about how PCA differs from LDA.	2	K2	CO4
8.	State about the curse of dimensionality.	2	K1	CO4
9.	Enumerate the advantages of evolutionary algorithms.	2	K2	CO5
10.	List the applications of Genetic Algorithm.	2	K1	CO5

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

				Marks	K-Level	CO
11.	a)	i)	Explain in detail about the Perspectives and Issues in Machine Learning with a suitable problem.	8	K2	CO1
		ii)	Discuss the Limitations of Find-S algorithm.	5	K2	CO1
			OR			
	b)		Explain the Candidate-Elimination algorithm to output a description of the set of all Hypotheses consistent with the training examples.	13	K2	CO1
12.	a)	i)	State the important characteristics of Multi Layer Perceptron.	7	K2	CO2
		ii)	Explain the need of a Multilayer Perceptron.	6	K2	CO2
			OR			
	b)		Explain how SVMs are used in Classification and Regression Analysis.	13	K2	CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

13. a)	Illustrate Decision tree Algorithm with an Example.	13	K2 CO3

<div align="center">OR</div>

b)	Explain in detail about the K-Means algorithm with suitable example.	13	K2 CO3

14. a)	What is Dimensionality Reduction? Why is Dimensionality Reduction important in Machine Learning and Predictive Modeling?	13	K2 CO4

<div align="center">OR</div>

b) i)	Describe Locally Linear Embedding algorithm.	8	K2 CO4
ii)	Explain Kernel PCA.	5	K2 CO4

15. a)	Explain the significance of Hidden Markov models in machine learning.	13	K2 CO5

<div align="center">OR</div>

b)	Discuss in detail about the Markov Decision Process.	13	K2 CO5

<div align="center">

PART - C (1 × 15 = 15 Marks)

</div>

16. a) i)	Explain Genetic Algorithms with relevant examples.	10	K2 CO5
ii)	List the importance and the applications of Genetic Algorithms.	5	K2 CO5

<div align="center">OR</div>

b)	Suppose we have 5 rooms in a building connected by doors as shown in the figure. We will number each room from 0-4.The outside of the building can be thought of as a big room (room 5) Notice that doors 1 and 4 can lead into the building from room 5.Apply Reinforcement learning (Q-Learner) algorithm to get optimal path.	15	K3 CO5