Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110
(An Autonomous Institution, Affiliated to Anna University, Chennai)
Department of Computer Science and Engineering
Continuous Assessment Test – III
Question Paper

Degree & Branch	B.E. & CSE				Semester	VI
Subject Code & Name	UCS1603 & INTRODUCTION TO MACHINE LEARNING				Regulation:	2018
Academic Year	2021-2022	Batch	2019-2023	Date	03.06.2022	FN
Time: 90 minutes (8.30-10.00 AM)	Answer All Questions				Maximum: 50 Marks	

Part – A (6×2 = 12 Marks)

<K3>	1. In a search scenario, a local maximum value is chosen as an action during the exploration process of Reinforcement Learning. Identify the suitable search method of action for this scenario.	<CO4>
<K2>	2. "When $\gamma = 1$, the case turns to be episodic case in Reinforcement Learning", Justify this comment.	<CO4>
<K3>	3. Find the distance between the two vectors (4, 2, 6, 8) and (5, 1, 7, 9) using Minkowski distance for p=1.	<CO4>
<K2>	4. Briefly explain any two real time applications of Reinforcement Learning?	<CO4>
<K1>	5. List the three types of search approaches in optimization.	<CO5>
<K2>	6. Differentiate Exploitation vs Exploration.	<CO5>

Part – B (3×6 = 18 Marks)

<K3>	7. Apply suitable clustering algorithm to find the sum of squared error for the following data. In a supermarket application, based on the following two features (X and Y), the customers are grouped into two clusters with the cluster heads as (2.67, 4.67) and (2.0, 1.83) respectively. The instances 2, 4, 6 belong to cluster1 and instances 1, 3, 5 belong to cluster2. 	<CO4>

Instances	X	Y
1	1	1.5
2	1	4.5
3	2	1.5
4	2	3.5
5	3	5
6	5	6

<K2>	8. Explain the Levenberg Marguardt (LM) algorithm and its importance in optimization techniques.	<CO5>

<K3>	9. How gradient descent algorithm is applied in optimization function? Explain with diagram and necessary equations.	<CO5>

Part – C (2×10 = 20 Marks)

<K2>	10. Why do we need Reinforcement Learning (RL)? Explain the relationship between RL and Markov Decision Process.	<CO4>

(OR)

<K2>	11. Explain SARSA and Q-learning algorithms of Reinforcement Learning and their uniqueness in policy iteration process.	<CO4>

<K3>	12. Apply K-means clustering to find the clusters for the given data points to their respective clusters and the cluster heads. Assume K=2, initial cluster heads as instance 1 and instance 3. Find the final cluster heads and their data points.	<CO4>

Instance	X	Y
1	1	1
2	2	2
3	4	3
4	1	4
5	6	5

(OR)

<K3>	13. A robot is deployed in SSN to help the visitors to reach location. The locations are CSE department, ECE department, Admin, Auditorium and Canteen. Apply Reinforcement Learning, to draw the state diagram and reward matrix of this robot with architecture and discounting factor.	<CO4>