

Register No : _____

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Seventh Semester

Civil Engineering

OCS351 - Artificial Intelligence and Machine Learning Fundamentals

(Common to Chemical Engineering)

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	Show the structure of agent in an environment.	RE	1	2
2.	What is the main objective of Breadth-First Search (BFS)?	RE	1	2
3.	Define Mini Max search algorithm.	RE	2	2
4.	State the difference between informed and uninformed search.	UN	2	2
5.	List out the types of machine learning algorithms.	RE	3	2
6.	What is bias in machine learning?	RE	3	2
7.	Recall the term Gini impurity.	RE	4	2
8.	Interpret the types of layers present in back propagation network.	UN	4	2
9.	What are the advantages of clustering analysis?	RE	5	2
10.	Compare between the unstructured data and unlabelled data.	UN	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q.No	Questions	BLT	CO	Marks
11.	a i Outline the history and explain the key developments in artificial intelligence.	UN	1	6
	ii Develop Dijkstra's algorithm with an example, showing how it finds the shortest path.	UN	1	7
	Or			
	b i How does an agent can determine its actions in a partially observable environment?	UN	1	6
	ii Identify the effectiveness of Depth-Limited search compared to standard DFS and BFS.	UN	1	7
12.	a i What is the purpose of A* Algorithm and explain how the A* algorithm to solve a simple path finding problem on a grid.	UN	2	7
	ii How can we classify search algorithms? Discuss about the properties and role of search algorithms.	UN	2	6

Or

	b	i	How can we reduce the computational cost of game search by using alpha-beta pruning.	UN	2	7
		ii	Define CSP. Explain about the CSP model for a basic map-coloring problem, detailing the constraints.	UN	2	6
13.	a	i	Compare and contrast between the different categories of approaches in machine learning models.	AN	3	7
		ii	Describe inductive bias in detail and state its importance in machine learning.	UN	3	6
			Or			
	b	i	Explain the interpreted results for a sample data using linear regression.	UN	3	7
		ii	State the differences between training, validation, and test sets in model evaluation.	UN	3	6
14.	a		Create a perceptron network for a simple binary classification problem and demonstrate its working.	CR	4	13
			Or			
	b		Build a sample dataset for rule based classification algorithm. Inspect the strengths and weaknesses of rule-based classification in comparison to other methods.	CR	4	13
15.	a		List out and describe about the various types of unsupervised learning.	AN	5	13
			Or			
	b		Classify between the concept of hierarchical clustering algorithms and k-means algorithms in detail.	AN	5	13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>	
16.	a	i	Analyze the impact of overfitting on a model's performance and how to address it.	AN	3	8
		ii	Classify the performance and use cases of decision trees and SVMs in classification.	AN	4	7
		Or				
	b	i	Examine how a problem-solving agent would approach a puzzle like the 8-puzzle by breaking it down into a series of smaller moves.	AN	2	7
		ii	Discover the challenges, advantages and disadvantages of unsupervised learning.	AN	5	8