Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

Seventh Semester

Civil Engineering

OCS351- Artificial Intelligence and Machine Learning Fundamentals

(Common to Agricultural Engineering, Chemical Engineering & Mechanical 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.	Define Artificial Intelligence.	L1	1	2
2.	What are the agents doing for AI and software?	L1	1	2
3.	How does adversarial search work and what purpose does it serve in decision-making processes?	L1	2	2
4.	Differentiate between Blind search and Heuristics search.	L2	2	2
5.	Identify the needs of probabilistic reasoning in AI.	L2	3	2
6.	List out the five popular algorithms of Machine learning.	L1	3	2
7.	How can Gini Impurity be described and what formula is used to calculate it?	L1	4	2
8.	Give the real time applications of SVM and Naïve Bayes.	L1	4	2
9.	What are the different algorithms used in hierarchical clustering to create structured clusters?	L1	5	2
10.	How do Kohonen Self-Organizing Feature Maps differ from Fixed Weight Competitive Net in terms of their structure and learning process?	L2	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a		How would you describe the various uninformed search strategies like breadth-first search and depth-first search with examples?	L2	1	16
			Or			
	b	i	Enumerate classical “Water Jug Problem” and describe the state space for this problem and also give the solution.	L2	1	8
		ii	In what ways does Dijkstra’s algorithm work and can you provide a real time example to demonstrate its process.	L2	1	8
12.	a	i	What is Min Max search algorithm and explain how it take part in tic-tac-toe game.	L4	2	8
		ii	Explain A* search algorithm and give the proof of optimality of A*.	L4	2	8
			Or			
	b		State the constraint satisfaction problem with an algorithm for solving crypt arithmetic. Trace the algorithm for the following: CROSS + ROADS ---------- DANGER ----------	L4	2	16

13.	a	i	Explain hypothesis space and inductive bias in linear algebra.	L2	3	8
		ii	What role do Linear algebra and Analytical geometry play in of Machine Learning and can you provide real time examples to illustrate their applications?	L2	3	8
			Or			
	b		How regression differs from classification? What is the similarity between the two? Briefly discuss the following types of regression: a) Linear regression b) Multiple linear regression c) Logistic regression d) Polynomial regression	L2	3	16
14.	a		Explain the steps in the back propagation learning algorithm. What is the importance of it in designing neutral networks?	L2	4	16
			Or			
	b		Explain the concept of decision tree learning, Discuss the necessary measure required to select the attributes for building decision tree using ID3.	L2	4	16
15.	a	i	Explain various learning techniques involved in unsupervised learning.	L2	5	8
		ii	Illustrate the applications and challenges of clustering algorithms.	L2	5	8
			Or			
	b	i	What are the main steps involved in organizing data into clusters with the K-means algorithm with an example.	L2	5	8
		ii	How can neutral network be used in manufacturing industry explain the steps in detail.	L2	5	8