Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

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

Third Semester

Artificial Intelligence and Data science

AL3391 / UADT24301 – Artificial Intelligence

Regulations – 2021 & 2024

Duration : 3 Hrs *Maximum : 100 Marks*

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

Q.No	*Questions*	*BTL*	*CO*	*Marks*
1.	Define the term Agent and Environment with an example.	L1	1	2
2.	Point out the components of an Intelligent Agent.	L2	1	2
3.	Give an example of a Heuristic function for the 8-puzzle problem.	L2	2	2
4.	Mention the real time application of Online search.	L1	2	2
5.	What is the purpose of the Monte Carlo Tree Search algorithm?	L2	3	2
6.	Sate Constraint Propagation.	L1	3	2
7.	How do propositional logic-based agents represent knowledge?	L3	4	2
8.	Define the logical connectives: AND (∧) and IMPLIES (→).	L2	4	2
9.	Write the concepts of Bayes Theorem.	L1	5	2
10.	Illustrate the computational complexity of exact inference.	L3	5	2

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

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	Explain the components of a Problem-Solving agent with an example.	L2	1	8
		ii	Write the concept of a Rational agent with an example.	L2	1	8
			Or			
	b		Describe the working techniques of Breadth First Search (BFS) and Depth First Search (DFS) with an example.	L2	1	16
12.	a		With an example, what are the challenges of applying Local Search in Continuous State Spaces?	L3	2	16
			Or			
	b	i	How does LRTA algorithm improve over basic A* in unknown environments?	L3	2	8
		ii	How an agent maintains and updates belief states during Partially Observable Search?	L3	2	8

13.	a		Illustrate about Alpha-Beta Pruning algorithm and the Minmax Game Playing algorithm with an example.	L2	3	16
			Or			
	b	i	State Stochastic Games. How does the expectiminimax algorithm works in a competitive environment?	L2	3	8
		ii	Write the concepts of AC-3 Algorithm in CSP with an example.	L2	3	8
14.	a	i	With architecture, describe about Knowledge based agent. How does it make decisions using logical reasoning?	L3	4	8
		ii	Construct a truth table for the formula: $(P \land Q) \rightarrow \neg R$ and explain its semantics.	L3	4	8
			Or			
	b	i	How does forward chaining work in First-Order Logic? Demonstrate with a rule-based inference example.	L3	4	8
		ii	Describe the process of converting FOL sentences to clause form for inference.	L3	4	8
15.	a		Analyze the mathematical computation for Naive Bayes computation in probabilistic classification with an example.	L4	5	16
			Or			
	b	i	Explain the concept of Bayesian inference and how it is used to update probabilities?	L4	5	8
		ii	What is probabilistic reasoning, and how does it differ from deterministic reasoning?	L4	5	8