PVP 23

Code: 23EC6401

II B.Tech - II Semester – Honors Examinations - MAY 2025

ARTIFICIAL INTELLIGENCE

(HONORS in ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.
4. All parts of Question paper must be answered in one place.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1.a)	Define Artificial Intelligence (AI) and describe its main objectives.	L1	CO1
1.b)	What is cognitive modeling in AI?	L2	CO1
1.c)	What is a learning agent?	L2	CO1
1.d)	What is a utility-based agent?	L2	CO1
1.e)	How does a problem-solving agent differ from a reactive agent?	L2	CO1
1.f)	What are the real-world applications of search-based problem-solving?	L2	CO3
1.g)	Define the term heuristic search and give an example.	L1	CO1
1.h)	Define the properties of an admissible heuristic.	L1	CO1
1.i)	Provide an example of a real-world Constraint Satisfaction Problem.	L2	CO1
1.j)	What are the three main components of a Constraint Satisfaction Problem?	L2	CO4

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Define a rational agent in AI. How does the rational agent approach differ from the Turing Test approach?	L2	CO2	5 M
	b)	Give examples of AI applications that follow the rational agent approach.	L3	CO2	5 M
OR					
3	a)	Explain the foundation of an AI in terms of i) Mathematics ii) Philosophy iii) Computer science.	L2	CO1	5 M
	b)	Demonstrate the laws of thought in AI? What are the limitations of the "laws of thought" approach in AI?	L3	CO2	5 M
UNIT-II					
4		Illustrate simple reflex agent, How does a simple reflex agent differ from model-based reflex agent.	L3	CO2	10 M
OR					
5	a)	Distinguish between goal-based and utility-based agents. What is the advantage of a utility-based approach in AI?	L2	CO2	5 M
	b)	Discuss the four main types of agents in AI? How does an agent's internal structure influence its behavior?	L2	CO2	5 M

UNIT-III					
6	a)	Explain the 8-puzzle problem and how it can be solved using search algorithms.	L3	CO3	5 M
	b)	Explain the Depth-First Search (DFS) algorithm.	L3	CO3	5 M
OR					
7	a)	Explain how maze-solving can be approached using search techniques.	L3	CO3	5 M
	b)	What is Uniform Cost Search (UCS)? How does UCS differ from BFS?	L3	CO3	5 M
UNIT-IV					
8	a)	Explain Greedy Best-First Search and how it selects the next node.	L3	CO3	5 M
	b)	Explain the hill-climbing algorithm and how it works.	L3	CO3	5 M
OR					
9	a)	Explain heuristic function, and how does it guide search algorithms?	L4	CO3	5 M
	b)	Point out the advantages and disadvantages of Greedy Best-First Search?	L4	CO3	5 M
UNIT-V					
10	a)	What is backtracking search, and explain its usage in Constraint Satisfaction Problems?	L4	CO4	5 M
	b)	Explain the search strategy with map coloring in Constraint Satisfaction Problem (CSP) solving.	L4	CO4	5 M

OR					
11	a)	Explain the role of simulated annealing in local search for Constraint Satisfaction Problems?	L4	CO4	5 M
	b)	How does forward checking improve backtracking efficiency? Explain in detail.	L4	CO4	5 M