Reg. No.															

Question Paper Code	13443

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Sixth Semester

Computer Science and Business Systems

20CBPC603 - ARTIFICIAL INTELLIGENCE

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	*K – Level*	*CO*
1.	Which approach is used in Tic-Tac-Toe for AI to make optimal moves? (a) Neural networks (b) Genetic algorithms (c) Minimax algorithm (d) Reinforcement learning	*1*	*K1*	*CO1*
2.	A production system consists of: (a) Rules, states, and control strategy (b) A single decision tree (c) Random actions (d) A predefined answer	*1*	*K1*	*CO1*
3.	Which of the following is true about *A Search** algorithm? (a) A* only considers the heuristic function to evaluate nodes. (b) A* always finds the optimal solution, provided the heuristic is admissible and consistent. (c) A* uses only the path cost to evaluate nodes. (d) A* does not guarantee finding the optimal solution even with an admissible heuristic.	*1*	*K1*	*CO2*
4.	Bidirectional search reduces search complexity by: (a) Searching from both start and goal states (b) Expanding all nodes in one direction only (c) Using heuristic functions (d) Avoiding goal testing	*1*	*K1*	*CO2*
5.	In game theory, a "saddle point" in a payoff matrix corresponds to: (a) The best move for both players (b) A Nash equilibrium (c) The worst possible outcome (d) A state where both players lose	*1*	*K1*	*CO3*
6.	Which search algorithm is commonly used for solving CSPs efficiently? (a) Breadth-first search (b) Depth-first search (c) Backtracking search (d) A* search	*1*	*K1*	*CO3*
7.	Which knowledge representation approach is based on objects and their relationships? (a) Frames (b) Statistical Models (c) Neural Networks (d) Decision Trees	*1*	*K1*	*CO4*
8.	Which of the following is an example of control knowledge? (a) A database of historical events (b) A rule stating that "IF fever THEN take medicine" (c) A strategy for selecting the best inference rule to apply (d) A list of symptoms of diseases	*1*	*K1*	*CO4*
9.	Which of the following is commonly used to represent domain knowledge in expert systems? (a) IF-THEN rules (b) Neural networks (c) Genetic algorithms (d) Relational databases	*1*	*K1*	*CO5*
10.	In AI planning, what is the primary objective of a goal stack? (a) To store all possible actions (b) To keep track of sub goals that need to be achieved (c) To represent a neural network structure (d) To execute actions in random order	*1*	*K1*	*CO5*

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Define rational agent.	*2*	*K1*	*CO1*
12.	List out the issues in design of search program.	*2*	*K1*	*CO1*
13.	Interpret some tasks in AI.	*2*	*K2*	*CO1*
14.	Define goal formulation.	*2*	*K1*	*CO2*
15.	Show four important criteria in any search Algorithm.	*2*	*K2*	*CO2*
16.	Summarize Greedy Best-First Search is inefficient despite its simplicity.	*2*	*K2*	*CO2*
17.	What is the need for arc consistency?	*2*	*K1*	*CO3*
18.	Illustrate the advantages and disadvantages of alpha-beta pruning.	*2*	*K2*	*CO3*
19.	Define Heuristic Knowledge.	*2*	*K1*	*CO4*
20.	Demonstrate the steps in the cycle of knowledge representation in AI.	*2*	*K2*	*CO4*
21.	What is STRIPS Mechanis?	*2*	*K1*	*CO5*
22.	List down the components of the planning system.	*2*	*K1*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain Intelligent Agents with block diagram and example.	*11*	*K2*	*CO1*
		OR			
	b)	Given the Tic-Tac-Toe problem, show how would you define it as a state-space search problem? What would the states, actions, and goal states look like?	*11*	*K2*	*CO1*
24.	a)	Make use of the main characteristic of the Hill Climbing Search algorithm. Explain with example.	*11*	*K3*	*CO2*
		OR			
	b)	Experiment with Greedy Best-First Search and *A Search** in terms of their efficiency and ability to find the optimal solution. Under which circumstances would you choose one over the other?	*11*	*K3*	*CO2*
25.	a)	Demonstrate alpha-beta pruning with an example.	*11*	*K2*	*CO3*
		OR			
	b)	Explain iterative deepening depth first search with example.	*11*	*K2*	*CO3*
26.	a)	Construct the steps to convert first order logic sentence to normal form? Solve each step in detail.	*11*	*K3*	*CO4*
		OR			
	b)	Apply the unification algorithm used for reasoning under predicate logic with an example.	*11*	*K3*	*CO4*
27.	a)	Compare probability and reasoning with examples in field of artificial intelligence.	*11*	*K2*	*CO5*
		OR			
	b)	Explain knowledge acquisition in detail with examples.	*11*	*K2*	*CO5*
28.	a) (i)	Explain about Knowledge representation issues.	*6*	*K2*	*CO4*
	(ii)	Contrast Bayesian network in detail.	*5*	*K2*	*CO5*
		OR			
	b) (i)	Explain about Control Knowledge.	*6*	*K2*	*CO4*
	(ii)	Summarize Dempster – Shafer theory.	*5*	*K2*	*CO5*