



BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – Dip.CSE-2022/Dip.CSE-2023
Course Name – Fundamentals of AI
Course Code - DCSE-PE602A
(Semester VI)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Identify the main goal of Artificial Intelligence.
 - a) To replace human intelligence
 - b) To develop systems that mimic human intelligence
 - c) To improve computer hardware
 - d) To increase internet speed
- (ii) Identify the game that is commonly used to explain AI techniques in decision-making.
 - a) Chess
 - b) Tic-Tac-Toe
 - c) Sudoku
 - d) Poker
- (iii) Identify the correct example of a production system.
 - a) Spreadsheet software
 - b) Expert Systems
 - c) Operating Systems
 - d) Social Media Platforms
- (iv) Identify the term used to describe AI techniques that search through all possible states to find a solution.
 - a) Decision Trees
 - b) State Space Search
 - c) Neural Networks
 - d) Genetic Algorithms
- (v) Identify the term used for AI systems that use a set of "if-then" rules to reach conclusions.
 - a) Reinforcement Learning
 - b) Expert System
 - c) Genetic Algorithms
 - d) Neural Networks
- (vi) Select the type of agent used for problem-solving in AI.
 - a) Reflex Agent
 - b) Problem-Solving Agent
 - c) Learning Agent
 - d) Utility-Based Agent
- (vii) Choose the search technique that explores as deep as possible before backtracking.
 - a) Depth-First Search
 - b) Breadth-First Search
 - c) A* Search
 - d) Minimax Search
- (viii) Select the search strategy that uses heuristics to decide the best path.

- a) Uniform Cost Search
- b) Breadth-First Search
- c) Minimax Search
- d) Greedy Best-First Search
- (ix) Select the technique that helps in reducing the number of nodes evaluated in minimax.
 - a) Heuristic Search
 - b) Greedy Best-First Search
 - c) Bidirectional Search
 - d) Alpha-Beta Pruning
- (x) Identify the type of learning that requires labelled data.
 - a) Unsupervised Learning
 - b) Reinforcement Learning
 - c) Supervised Learning
 - d) Inductive Learning
- (xi) Select the main goal of supervised learning.
 - a) Finding hidden patterns
 - b) Predicting outcomes
 - c) Maximizing rewards
 - d) Applying logical rules
- (xii) Identify the algorithm mostly used in supervised learning.
 - a) K-Means Clustering
 - b) Q-Learning
 - c) Decision Trees
 - d) Genetic Algorithms
- (xiii) Select the correct example of reinforcement learning.
 - a) Identifying cancer in X-rays
 - b) Grouping customers by purchase behavior
 - c) AI playing chess
 - d) Spam filtering
- (xiv) Label the type of AI learning where patterns are discovered from unlabelled data.
 - a) Unsupervised Learning
 - b) Reinforcement Learning
 - c) Inductive Learning
 - d) Supervised Learning
- (xv) State a key limitation of supervised learning.
 - a) Completely automatic
 - b) Cannot be used for classification
 - c) Requires a large amount of labelled data
 - d) Cannot handle numeric data

Group-B

(Short Answer Type Questions)

3 x 5=15

- 2. Compare the advantages and limitations of goal stack planning. (3)
- 3. Explain the difference between goal-based agents and utility-based agents in AI. (3)
- 4. State any two applications of Artificial Intelligence. (3)
- 5. Explain why hill climbing is considered a greedy search technique. (3)
- 6. Categorize the limitations of Hill Climbing search and explain how these limitations can be addressed. (3)

OR

Categorize and explain the role of the evaluation function in minimax search. How does alpha-beta pruning improve minimax search? (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

- 7. Discuss How Local Search Algorithms Handle Large Optimization Problems (5)
- 8. Explain Hill Climbing Search Algorithm. (5)
- 9. Explain Adversarial Search in AI (5)
- 10. Analyze the advantages and limitations of inductive learning. (5)
- 11. Define Artificial Intelligence (AI) and describe its significance in solving real-world problems. (5)
- 12. Analyze the role of the different components of a planning system in solving a real-world problem, such as autonomous vehicle navigation or robotic path planning. Explain how each component contributes to achieving the final goal. (5)

OR

Classify the key components of a planning system in detail. (5)
