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BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – M.Tech.(CSE)-DS-2025
Course Name – Artificial Intelligence for Data Science
Course Code - MTD20406
(Semester II)

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 primary goal of an intelligent agent in Artificial Intelligence.
a) Store data b) Maximize performance based on percepts
c) Reduce computation d) Replace humans

(ii) Classify the problem-solving approach used in the 8-puzzle problem.
a) Continuous optimization b) State space search
c) Supervised learning d) Reinforcement learning

(iii) Choose the search algorithm that guarantees optimality with admissible heuristic.
a) DFS b) Greedy
c) A* d) Minimax

(iv) Identify the AI technique used for reasoning under uncertainty.
a) Decision Tree b) Bayesian Network
c) Linear Regression d) Clustering

(v) Identify the component enabling agents to perceive environment.
a) Actuators b) Sensors
c) Goals d) Utility

(vi) Choose the heuristic search used in map navigation.
a) DFS b) BFS
c) A* d) Minimax

(vii) Identify the basic unit of propositional logic.
a) Predicate b) Variable
c) Proposition d) Quantifier

(viii) Select dimensionality reduction technique.
a) KNN b) PCA
c) NB d) ID3

(ix) Identify the logical connective representing implication.

a) $\wedge$ b) $\vee$
c) $\rightarrow$ d) $\neg$

(x) Select the quantifier used to express universality.

a) $\exists$ b) $\forall$
c) $\Rightarrow$ d) $\Leftrightarrow$

(xi) Categorize Bayesian networks based on uncertainty handling.

a) Deterministic b) Probabilistic
c) Fuzzy d) Logical

(xii) Categorize reinforcement learning based on feedback type.

a) Labeled b) Unlabeled
c) Reward-based d) Rule-based

(xiii) Predict the AI technique suitable for sentiment classification.

a) Regression b) Classification
c) Clustering d) Reinforcement

(xiv) Predict the role of AI in autonomous vehicles.

a) Manual driving b) Route prediction
c) Traffic policing d) Data storage

(xv) Recommend the AI solution for anomaly detection in networks.

a) Regression b) Clustering
c) Encoding d) Sorting

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define an intelligent agent and identify its main components. (3)
3. Classify search strategies used in Artificial Intelligence. (3)
4. Define the minimax principle and identify its role in adversarial decision-making. (3)
5. Justify the need for hybrid knowledge representation schemes in AI. (3)
6. Justify the need for heuristic information in intelligent search. (3)

OR

Evaluate the limitations of heuristic functions in informed search algorithms. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Define knowledge representation and explain the role of propositional and predicate logic in reasoning. (5)
8. Explain supervised learning and justify the use of decision trees and linear regression for different problems. (5)
9. Explain Depth First Search and analyze why it is memory efficient but risky in some applications. (5)
10. Explain model evaluation and analyze its importance in ML systems. (5)
11. Evaluate the role of ethical AI in sustainable technological development. (5)
12. Explain reinforcement learning and analyze its learning mechanism. (5)

OR

Evaluate supervised learning models from the perspective of bias, variance, and real-world deployment challenges. (5)

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