17684

BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – MCA-2024
Course Name – Artificial Intelligence
Course Code - MCA37112 (T)
(Semester III)

Full Marks : 40 **Time : 2:0 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 10=10

1. *Choose the correct alternative from the following :*

(i) Which agent is capable of improving its performance by learning?

a) Utility-based agent
b) Simple reflex agent
c) Learning agent
d) Model-based agent

(ii) What is AI primarily concerned with designing systems that can do?

a) Store data securely
b) Think and act rationally
c) Operate on low power
d) Avoid programming

(iii) Define an environment where the agent's current action does not affect future actions.

a) Static
b) Episodic
c) Sequential
d) Stochastic

(iv) Infer the scenario in which Uniform Cost Search is most effective.

a) All actions have equal cost
b) Cost varies and optimality is needed
c) Only depth is a concern
d) Random actions are preferred

(v) Identify the type of game that involves randomness or chance.

a) Zero-sum
b) Deterministic games
c) Perfect-information games
d) Stochastic games

(vi) Identify the technique that allows inference with incomplete information in probabilistic systems.

a) Exact resolution only
b) Bayesian networks
c) Backpropagation
d) Rule-based systems

(vii) Identify the main advantage of using Bayesian networks in uncertain environments.

a) They eliminate uncertainty
b) They provide deterministic answers
c) They use graphical models to manage dependencies and uncertainty
d) They are only used for logic gates

(viii) Distinguish the learning technique that uses explanations to form generalizations for improved performance.

a) Reinforcement learning
b) Explanation-based learning

c) Genetic algorithm | d) Inductive logic programming

(ix) Identify and Evaluate the major problem traditional RNNs face with long sequences.

a) High image noise | b) Overfitting during training
c) Vanishing or exploding gradients | d) Lack of pooling

(x) Assess the improvement that LSTM introduces over basic RNNs.

a) Faster image recognition | b) Shorter training times
c) Memory cells to retain long-term dependencies | d) Simpler architecture

Group-B

(Short Answer Type Questions) 3 x 5=15

2. What is the function of a learning agent? (3)
3. Explain the difference between BFS and DFS with respect to completeness and memory usage. (3)
4. Describe the concept of a Bayesian network and its purpose. (3)
5. Analyze how fuzzy logic differs from probability theory in handling uncertainty. (3)
6. Evaluate the importance of semantic and pragmatic processing in Natural Language Understanding. (3)

OR

Evaluate the strengths of genetic algorithms in learning and problem-solving. (3)

Group-C

(Long Answer Type Questions) 5 x 3=15

7. Explain the working of the A* search algorithm and justify why it guarantees completeness and optimality when appropriate conditions are met. (5)
8. Analyze the architecture and working of a decision tree learning algorithm. How does it help in decision-making? (5)
9. Evaluate the limitations of traditional neural networks and how CNNs address them. (5)

OR

Evaluate the components and training mechanism of Generative Adversarial Networks (GANs). (5)

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