BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Tech.(EE)]-2021
Course Name – Artificial Intelligence
Course Code - OE-EE701A
(Semester VII)

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 appropriate option for applying AI techniques:
a) Agricultural sector
b) Health care sector
c) Marketing sector
d) All of these

(ii) Identify the application languages used to implement AI:
a) Prolog
b) LISP
c) Python
d) All of these

(iii) Select the proper option that represents the device with AI functionality
a) Alexa
b) Siri
c) Google Assistant
d) All of these

(iv) Identify the AI type that is most common in current technology applications
a) General AI
b) Narrow AI
c) Artificial General Intelligence
d) Super AI

(v) Identify the primary challenge associated with developing AI systems that can mimic human perception
a) Lack of sufficient data
b) Limited understanding of human cognitive processes
c) High computational cost
d) Difficulty in building user interfaces

(vi) Define the concept that includes all possible ways to arrange objects and operations to achieve a goal
a) Problem
b) Problem Space
c) Search
d) Solution Set

(vii) Select the search technique that minimizes the total estimated cost using both path cost and heuristic.

a) Greedy Best-First Search
b) Depth-First Search
c) A* Search
d) Simulated Annealing

(viii) Select the approach that uses heuristics to rank nodes based on proximity to goal

a) Depth-First Search
b) Breadth-First Search
c) Greedy Best-First Search
d) A* Search

(ix) Identify the algorithm that maintains a list of nodes based on total estimated cost.

a) Depth-First Search
b) A* Search
c) Greedy Best-First Search
d) Simulated Annealing

(x) Indicate the search strategy that combines both local optimization and genetic operations.

a) Genetic Algorithms
b) Local Beam Search
c) Hill Climbing Search
d) Simulated Annealing

(xi) Choose the characteristic that ensures knowledge remains usable as it expands:

a) Scalability
b) Expressiveness vs. Complexity
c) Conceptual Dependency
d) Granularity of Representation

(xii) Choose the correct sequence in the resolution process:

a) Apply resolution, Check contradiction, Convert to CNF
b) Convert to CNF, Apply resolution, Check contradiction
c) Check contradiction, Apply resolution, Convert to CNF
d) Apply resolution, Convert to CNF, Check contradiction

(xiii) Choose the method that involves reasoning about the context and intentions behind language.

a) Semantic Analysis
b) Syntactic Processing
c) Pragmatic Processing
d) Morphological Processing

(xiv) Choose the learning approach that infers general principles from specific examples.

a) Deductive Learning
b) Inductive Learning
c) Reinforcement Learning
d) Explanation-based Learning

(xv) Choose the analysis that focuses on the relationships between sentences in a text.

a) Syntactic Processing
b) Discourse Analysis
c) Semantic Analysis
d) Pragmatic Processing

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Relate the concept of acquisition and learning in knowledge representation. (3)
3. Explain Natural Language Processing (NLP) and illustrate its application in machine translation. (3)
4. Explain discourse processing in NLP and illustrate its role in improving text comprehension. (3)
5. Describe the key characteristics of the Bidirectional Search technique. (3)
6. Justify the use of Bayesian networks for modeling probabilistic relationships in uncertain environments. (3)

OR

Compare the application of Bayesian networks and Dempster-Shafer theory in uncertainty management. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Discuss the key characteristics of problems in the context of artificial intelligence. (5)
8. Explain the key issues in knowledge representation in Artificial Intelligence. (5)
9. Classify the components of expert systems and justify the significance of knowledge acquisition in developing effective expert systems. (5)
10. Explain the working of Best-First Search with an example. (5)
11. Explain the major drawbacks of the Hill Climbing Search algorithm. (5)
12. Summarize the different forms of learning in artificial intelligence with example. (5)

OR

Compare and contrast inductive learning, learning decision trees, explanation-based learning, and genetic learning in artificial intelligence. (5)

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