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BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – Dip.CE-2022/Dip.CE-2023
Course Name – Artificial Intelligence
Course Code - DCEO602A
(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 search technique uses the stack operation
 - a) Depth-first search
 - b) Breadth-first search
 - c) Bidirectional search
 - d) None of these
- (ii) Select the data structure used to implement BFS.
 - a) Queue
 - b) Stack
 - c) Priority Queue
 - d) Circular Queue
- (iii) Select the appropriate way the value of alpha-beta search gets updated
 - a) Along the path of search
 - b) Initial state itself
 - c) At the end
 - d) None of the mentioned
- (iv) Select the search technique is implemented by first-in- first-out queue
 - a) Depth-first search
 - b) Breadth-first search
 - c) Bidirectional search
 - d) None of the mentioned
- (v) Select the environment used by adversarial search problems
 - a) Competitive Environment
 - b) Cooperative Environment
 - c) Neither a nor b
 - d) All of these
- (vi) Choose the A* heuristic evaluation function
 - a) $f(x)=h(x)+ g(x)$
 - b) $f(x)=h(x)$
 - c) $f(x)=g(x)$
 - d) None of the mentioned
- (vii) Identify the limitation of Hill-Climbing method
 - a) Local maxima
 - b) Ridges
 - c) Plateau
 - d) All of these
- (viii) Identify the suitable algorithm applied on game tree for making decision of win/lose.
 - a) DFS/BFS Search
 - b) Heuristic Search Algorithms
 - c) Greedy Search Algorithms
 - d) MIN/MAX Algorithms
- (ix) Identify the heuristic algorithm is similar to minimax search

- a) Depth-first search
b) Breadth-first search
c) Hill climbing
d) None of these
- (x) Identify data structure is used by Depth First Search
a) Stack
b) Queue
c) Priority queue
d) Linked list
- (xi) Select the following: Let P: We should be honest., Q: We should be dedicated., R: We should be overconfident. Then 'We should be honest or dedicated but not overconfident.' is best represented by:
a) $\sim P \vee \sim Q \vee R$
b) $P \wedge \sim Q \wedge R$
c) $P \vee Q \wedge R$
d) $P \vee Q \wedge \sim R$
- (xii) Select the following: Let P: This is a great website, Q: You should not come back here. Then 'This is a great website and you should come back here.' is best represented by:
a) $\sim P \vee \sim Q$
b) $P \wedge \sim Q$
c) $P \vee Q$
d) $P \wedge Q$
- (xiii) Select the following: Let P: I am in Delhi. , Q: Delhi is clean. ; then $Q \wedge P(Q \text{ and } P)$ is:
a) Delhi is clean and I am in Delhi
b) Delhi is not clean or I am in Delhi
c) I am in Delhi and Delhi is not clean
d) Delhi is clean but I am in Mumbai
- (xiv) Identify the correct one regarding Information that is widely accepted by the Knowledge Engineers and scholars in the task domain
a) Factual Knowledge
b) Heuristic Knowledge
c) Acquisition knowledge
d) None of these
- (xv) Identify the correct that the difference between procedural knowledge and declarative knowledge is based on
a) Procedural knowledge involves facts and concepts, while declarative knowledge involves explanation of how something is done.
b) Procedural knowledge is based on observation, while declarative knowledge involves understanding oneself.
c) Procedural knowledge involves how something is done, while declarative knowledge involves facts and concepts.
d) Procedural knowledge involves understanding oneself, while declarative knowledge is based on observation.

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Write about the different approaches to knowledge representation. (3)
3. Explain goal stack planning with an example. (3)
4. Describe various searching technique in AI. (3)
5. Describe the design issues of search space in AI. (3)
6. Explain the application of IoT in Civil Engineering. (3)

OR

Explain Prolog and Lisp in AI programming. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Define elementary logical connectives and universal logical connectives with examples. (5)
8. Describe the advantage of bi-directional search over BFS and DFS. (5)
9. Enumerate the components of AI production system, give two examples. (5)
10. Analyze the significance of ISA relationships in predicate logic. (5)
11. Explain game playing in AI with a suitable example. (5)
12. Analyze the role of natural deduction in AI reasoning. (5)

OR

Analyze the process of resolution in predicate logic. (5)