

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025
 Sixth Semester
Computer Science and Engineering
 (Common to Electronics and Communication Engineering)
20CSPC601 - ARTIFICIAL INTELLIGENCE
 Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)
 Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. A _____ agent can plan actions to achieve its goals. (a) Simple Reflex (b) Utility-Based (c) Goal-Based (d) Learning	1	K1	CO1
2. What is the primary focus of a utility-based agent? (a) Executing actions based on present percepts (b) Maintaining an internal state (c) Using a utility function to measure outcomes (d) Fulfilling predefined goals	1	K1	CO1
3. Best-First Search selects the node for expansion based on the _____ evaluation function. (a) heuristic (b) depth-first (c) breadth-first (d) uniform-cost	1	K1	CO2
4. Depth limited search is the new search algorithm for _____ . (a) Breadth first search (b) Depth first search (c) Uninformed search (d) Informed search	1	K1	CO2
5. In the Mini-max algorithm, what is the role of the maximizing player? (a) Maximizing the opponent's utility (b) Minimizing the opponent's utility (c) Maximizing its own utility (d) Minimizing its own utility	1	K1	CO3
6. Which of the following statements is true about Alpha-Beta pruning in the Minimax algorithm? (a) Alpha-Beta pruning changes the result of the Minimax algorithm. (b) Alpha-Beta pruning removes branches that cannot influence the final decision. (c) Alpha-Beta pruning removes branches that cannot influence the final decision. (d) Alpha-Beta pruning can only be used in deterministic games	1	K1	CO3
7. Ontologies provide a common _____ for sharing and understanding information across different systems. (a) interface (b) protocol (c) framework (d) Platform	1	K1	CO4
8. Backward-chaining is based on _____ inference rule. (a) Modus ponens (b) Modus Tollens (c) Hypothetical Syllogism (d) Disjunctive syllogism	1	K1	CO4
9. In planning graphs, what do the nodes represent? (a) Actions (b) States (c) Goals (d) Constraints	1	K1	CO5
10. A parse tree visually represents the _____ of a sentence. (a) sentiment (b) pronunciation (c) structure (d) Meaning	1	K1	CO6

PART - B (12 × 2 = 24 Marks)
 Answer ALL Questions

11. Define Artificial Intelligence.	2	K1	CO1
12. List the capabilities, computer should possess to pass Turing test.	2	K1	CO1
13. Define iterative deepening search.	2	K1	CO2
14. Differentiate DFS and BFS.	2	K2	CO2
15. Differentiate between Minimax and Alpha-Beta Pruning.	2	K2	CO3
16. Define a Stochastic Game with an example.	2	K1	CO3
17. List the key aspects of Ontology Engineering.	2	K1	CO4

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|---|---|----|-----|
| 18. Convert the sentence “Only one student failed in history” into Predicate Logic. | 2 | K2 | CO4 |
| 19. Explain the process of Explanation-Based Learning (EBL). | 2 | K2 | CO5 |
| 20. Summarize the conditions for a Mutex Relation. | 2 | K2 | CO5 |
| 21. Briefly explain n-gram Model with an example. | 2 | K2 | CO6 |
| 22. Summarize the applications of Natural Language Processing. | 2 | K2 | CO6 |

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

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| 23. a) How a problem is formally defined? List down the components of a formal problem definition with an example. | 11 | K2 | CO1 |
| OR | | | |
| b) Explain in detail, the structure of different intelligent agents. | 11 | K2 | CO1 |
| 24. a) Explain the following uninformed search strategies with examples. | 6 | K2 | CO2 |
| (i) Breadth First Search. | 5 | K2 | CO2 |
| (ii) Uniform Cost Search. | 5 | K2 | CO2 |
| OR | | | |
| b) (i) Show the logic behind the Local search state space landscape and its regions. | 5 | K2 | CO2 |
| (ii) Explain Hill climbing problem in detail with an algorithm. | 6 | K2 | CO2 |
| 25. a) Explain the concept of alpha beta pruning with your own example. Show step by step about how the pruning will be achieved in game theory. | 11 | K2 | CO3 |
| OR | | | |
| b) Explain how the Mini-max algorithm is used in decision-making and game theory. Explain step by step procedure with suitable example. | 11 | K2 | CO3 |
| 26. a) Given the following knowledge base: | 11 | K3 | CO4 |
| 1. All Americans who sell weapons to hostile nations are criminals | | | |
| 2. West is an American. | | | |
| 3. Nono is a hostile nation. | | | |
| 4. Nono has missiles. | | | |
| 5. All missiles are weapons. | | | |
| 6. West sold missiles to Nono. | | | |
| Apply backward chaining to determine whether West is a criminal. | | | |
| OR | | | |
| b) Apply the resolution technique to determine which game is liked by John, given the following facts: | 11 | K3 | CO4 |
| • John likes easy games | | | |
| • Boxing is hard | | | |
| • All indoor games are easy | | | |
| • Table tennis is an indoor game. | | | |
| 27. a) Discuss different types of Planning as State-Space Search with suitable representations and examples. | 11 | K2 | CO5 |
| OR | | | |
| b) Explain in detail about Knowledge in Learning with its significance in AI. | 11 | K2 | CO5 |
| 28. a) Explain different types of language models in Natural Language Processing and discuss any 4 applications of Natural Language Processing in detail. | 11 | K2 | CO6 |
| OR | | | |
| b) Explain the different types of chatbot. Write a program to implement a Simple chatbot. | 11 | K2 | CO6 |