

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZIANAGARAM

II B. Tech II Semester Supplementary Examinations November-2025

PRINCIPLES OF ARTIFICIAL INTELLIGENCE

(CSE (AI&DS) ,AI&DS)

Time: 3 hours

Max. Marks: 70

The Question paper consists of Part A & Part B.

Part A is compulsory, Answer all questions.

Part B Answers any one question from each unit.

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| 1 | PART-A | (20Marks) |
| a) | List various types of Agents. | [2] |
| b) | Mention any two differences between Informed Search and Uninformed Search Strategies. | [2] |
| c) | Define Game in the context of AI. | [2] |
| d) | What is heuristic search technique? | [2] |
| e) | Define Knowledge Representation. | [2] |
| f) | What is Learning? | [2] |
| g) | Define state space search | [2] |
| h) | List two examples of Expert systems. | [2] |
| i) | Write a short note on adversarial search. | [2] |
| j) | What is expert system shell | [2] |
| | PART-B | (50Marks) |
| | Question from Unit - I | |
| 2 | a) What is an AI technique? Discuss the problem of an AI technique with the help of examples. | [5] |
| | b) Explain What kinds of techniques will be useful for solving AI problems? | [5] |
| | (OR) | |
| 3 | a) Explain about Tic-Tac-Toe game problem by assuming one player is X the other one can be either human or a computer by taking 3X3 grid space. | [10] |
| | Question from Unit - II | |
| 4 | a) Define the terms: State space, search tree, search node, branching factor | [5] |
| | b) Explain why problem formulation must follow goal formulation. | [5] |
| | (OR) | |
| 5 | a) Discuss A* algorithm in detail. | [5] |
| | b) Solve the water-jug problem by writing the production rules. | [5] |
| | Question from Unit - III | |
| 6 | a) Explain the inference rules for quantifiers. | [5] |
| | b) Explain the syntax and semantics of propositional logic. | [5] |
| | (OR) | |
| 7 | a) Give the rules of inference in propositional logic and explain natural deduction using an example. | [5] |
| | b) Explain different equivalence laws (at least four). Verify the absorption law $A \vee (A \wedge B) \cong A$ using truth table. | [5] |
| | Question from Unit - IV | |
| 8 | a) Explain the issues in Knowledge Representation. Define Inheritance in Semantic Net. | [5] |
| | b) Explain extended semantic networks for Knowledge Representation. | [5] |

(OR)

- 9 a) Explain different links used in frames in a network of frames. Define a hospital frame along with Facet values. [5]
b) Explain about the rules for conceptual dependencies. [5]

Question from Unit - V

- 10 a) List the characteristics of expert systems. Classify various Expert System shells and tools. [5]
b) What is Inference Engine? Describe Backward and Forward chaining mechanism used by an inference engine? [5]

(OR)

- 11 a) With the help of a neat diagram, explain the Expert System Architecture [5]
b) How is an expert system different from a traditional program? [5]
