



Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (S,FE) (FT/WP/PT) Examinations May 2026 (2019 Scheme)

Course Code: CST401

Course Name: ARTIFICIAL INTELLIGENCE

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|--|-----|
| 1 | Define Rationality. | (3) |
| 2 | Distinguish between episodic and sequential environment. | (3) |
| 3 | Define state space, successor function and branching factor. | (3) |
| 4 | Compare informed and uninformed search | (3) |
| 5 | Define Constraint Satisfaction Problem with an example. | (3) |
| 6 | Define Precedence Constraints. | (3) |
| 7 | Is the sentence $\exists x, y \ x y$ valid? Explain. | (3) |
| 8 | Translate into first-order logic the following sentences:
1. Understanding leads to friendship.
2. Friendship is transitive. | (3) |
| 9 | Explain Reinforced Learning. | (3) |
| 10 | Differentiate Over-fitting & Under-fitting. | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

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|----|---|-----|
| 11 | a) How do we measure various approaches of Artificial Intelligence, if it is acting like a human? | (8) |
| | b) Explain Utility Based Agents. | (6) |

OR

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|----|--|-----|
| 12 | a) Explain the task environment PEAS for the following agents
a) Robots play soccer
b) Netflix on-line recommendation system
c) Expert system for medical diagnosis | (7) |
| | b) Explain Model Based Reflex Agents. | (7) |

Module II

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|----|---|-----|
| 13 | a) Explain A* Algorithm. Is it optimal in all conditions? | (7) |
| | b) Explain Alpha Beta Pruning with Example. | (7) |

OR

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|----|--|-----|
| 14 | a) Evaluate a problem as a state space search with an example. | (7) |
| | b) Explain Best First Search Algorithm with example. | (7) |

Module III

- 15 a) Explain AC3 Algorithm. (7)
 b) What is local consistency in CSP constraint propagation? Explain different types of local consistencies. (7)

OR

- 16 a) Give a precise formulation(components) of the following constraint satisfaction problem: (4)
 Class scheduling: There is a fixed number of professors and classrooms, a list of classes to be offered, and a list of possible time slots for classes. Each professor has a set of classes that he or she can teach.
 b) Explain Back Tracking Search in CSPs with the help of an example. (10)

Module IV

- 17 a) List any six differences between Forward & Backward chaining. (6)
 b) Explain the Backus Naur Form grammar of sentences in propositional logic (8)

OR

- 18 a) Explain Unification Algorithm with an example. (8)
 b) Illustrate the steps for converting First order logic (FOL) to Conjunctive Normal Form (CNF) with sentence- "*Thomas likes all kind of food.*" (6)

Module V

- 19 a) Explain decision tree algorithm. Consider the following data set comprised of two binary input attributes (A1 and A2) and one binary output. (10)

Example	A1	A2	Output Y
x1	1	1	1
x2	1	1	1
x3	1	0	0
x4	0	0	1
x5	0	1	0
x6	0	1	0

- b) State and explain Ockham's razor principle (4)

OR

- 20 a) Explain different types of Learning. (7)
 b) Explain Multivariate linear regression in detail. (7)
