

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VII EXAMINATION – SUMMER 2026

Subject Code:3170716

Date:03-06-2026

Subject Name: Artificial Intelligence

Time: 02:30 PM TO 05:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1**
- (a) What is meant by Perceptron? Give one example. **03**
 - (b) Differentiate between Breadth First Search and Best First Search **04**
 - (c) What is the state space of a problem? Explain state space representation for water jug problem. **07**
- Q.2**
- (a) Explain local maxima, plateau and ridge in brief. **03**
 - (b) Differentiate between Forward Reasoning and Backward Reasoning. **04**
 - (c) Discuss and Analyze Tower of Hanoi problem with respect to the seven problem characteristics. **07**

OR

- (c) Explain non-monotonic reasoning in detail. **07**
- Q.3**
- (a) Describe heuristic function for the Travelling Salesman Problem. **03**
 - (b) Discuss the Constraint Satisfaction Problem with example. **04**
 - (c) Solve the following Cryptarithmic Problem. **07**
- SEND
+ MORE

MONEY

OR

- Q.3**
- (a) Demonstrate the use of ‘cut’ predicates in Prolog with the help of a suitable example **03**
 - (b) Define the following. **04**
1. Modus Ponens 2. Horn Clause
- (c) Explain connectionist models. **07**
- Q.4**
- (a) Discuss Morphological Analysis in Natural Language Processing. **03**
 - (b) Describe working principle of Genetic Algorithm **04**
 - (c) Explain the back propagation algorithm for ANN. **07**

OR

- Q.4**
- (a) Describe Goal Stack planning. **03**
 - (b) Differentiate prepositional & predicate logic. **04**
 - (c) Explain Min Max search procedure in game playing. **07**
- Q.5**
- (a) Explain Syntax Analysis in Natural Language Processing. **03**
 - (b) Write a PROLOG program to find GCD of two numbers. **04**
 - (c) What is a “Semantic Net”? Illustrate ‘property inheritance’ in Semantic Network using “isa” and “instance” attributes. **07**

OR

- Q.5**
- (a) Demonstrate the use of ‘fail’ predicates in Prolog with the help of a suitable example **03**
 - (b) Write a PROLOG program to count the total occurrence of a character in a given list of characters. **04**
 - (c) Discuss Nonlinear Planning using Constraint Posting with example. **07**
