

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023**

**Subject Code:3170716****Date:14-12-2023****Subject Name: Artificial Intelligence****Time: 10:30 AM TO 01:00 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.

	<b>Marks</b>
<b>Q.1</b> (a) What is “Artificial Intelligence and Artificial Intelligence Technique”?	<b>03</b>
(b) Explain the algorithm for steepest hill climbing.	<b>04</b>
(c) Enumerate Classical “Water jug Problem”. Describe the state space for this problem and also give the solution.	<b>07</b>
<b>Q.2</b> (a) Differentiate propositional & predicate logic.	<b>03</b>
(b) What is clausal form? How is it useful?	<b>04</b>
(c) What is A* search? Explain various stages of A* search with an example.	<b>07</b>
<b>OR</b>	
(c) Define constraint satisfaction problem (CSP). How CSP is formulated as a search problem?	<b>07</b>
<b>Q.3</b> (a) Define Non monotonic reasoning.	<b>03</b>
(b) What is learning? Explain various learning techniques.	<b>04</b>
(c) Write unification algorithm and explain resolution in predicate logic.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Describe Bayes theorem.	<b>03</b>
(b) Explain local maxima, plateau, and ridge in detail.	<b>04</b>
(c) Differentiate forward chaining and backward chaining with suitable example.	<b>07</b>
<b>Q.4</b> (a) Explain connectionist models. What is perceptron?	<b>03</b>
(b) Explain mean-end analysis approach to solve AI problems.	<b>04</b>
(c) Describe the Expert System Development Procedure.	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) Explain different defuzzification methods.	<b>03</b>
(b) Explain Inference Rules in Propositional Calculus.	<b>04</b>
(c) Explain the Alpha-Beta Cutoffs Procedure in Game Playing.	<b>07</b>
<b>Q.5</b> (a) Explain morphological and syntax analysis phases of NLP.	<b>03</b>
(b) Explain the algorithm for Backpropagation in Neural Networks.	<b>04</b>
(c) Demonstrate the use of Cut and Fail Predicates in Prolog with example.	<b>07</b>
<b>OR</b>	
<b>Q.5</b> (a) Explain about the basic operators in genetic algorithms.	<b>03</b>
(b) Describe the various steps of Natural language Processing.	<b>04</b>
(c) What are the Applications, Features and Limitations of Prolog?	<b>07</b>

\*\*\*\*\*