

GUJARAT TECHNOLOGICAL UNIVERSITY

BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 3174601

Date: 20/05/2026

Subject Name: FUNDAMENTALS OF 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) Explain the concept of Rationality in AI. **03**
 - (b) Explain Agents and Environments with example. **04**
 - (c) List and explain applications of Artificial Intelligence. **07**
- Q.2**
- (a) Discuss approaches to Knowledge Representation. **03**
 - (b) What are the limitation of Hill Climbing Algorithm. **04**
 - (c) Compare and contrast Breadth First Search and Depth First Search with example. **07**
- OR
- Q.2**
- (c) Discuss A* Algorithm with example in detail. **07**
- Q.3**
- (a) Discuss Procedural vs. Declarative Knowledge **03**
 - (b) Discuss Bay's theorem. **04**
 - (c) Explain Alpha-Beta pruning algorithm and the minmax game playing algorithm with example. **07**
- OR
- Q.3**
- (a) Differentiate Forward and Backward Reasoning. **03**
 - (b) Explain symbolic and non-monotonic reasoning in detail. **04**
 - (c) Explain Bayesian Network with example. **07**
- Q.4**
- (a) List operations of Fuzzy Set with example **03**
 - (b) Explain Decision Trees in Machine Learning. **04**
 - (c) Discuss the methods of remove over-fitting problem. **07**
- OR
- Q.4**
- (a) Explain Fuzzy inference in brief **03**
 - (b) Discuss Cross validation with it's advantages and disadvantages. **04**
 - (c) Explain working of Back-Propagation in Artificial Neural Networks. **07**
- Q.5**
- (a) Discuss Biological Neurons and Biological Neural Networks. **03**
 - (b) List key features and limitations of K-nearest Neighbor **04**
 - (c) Explain Syntactic Processing and Semantic Analysis in NLP **07**

OR

Q.5	(a) Discuss Supervised learning, unsupervised learning and reinforcement learning	03
	(b) List key features and limitation of Linear Regression	04
	(c) Explain Discourse and Pragmatic Processing in NLP	07
