

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 7 – EXAMINATION – SUMMER 2026

Subject Code: 3171105

Date: 05/06/2026

Subject Name: Introduction 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)** Define Artificial Intelligence (AI). How AI different from natural intelligence? **03**
 - (b)** Discuss the components of a production systems. **04**
 - (c)** Describe Turing test. If the Turing test is passed, does this show that computers exhibit intelligence? State your reasons. **07**

- Q.2**
- (a)** Define: (i) Intelligence (ii) Rationality (iii) Logical reasoning. **03**
 - (b)** List the differences between Artificial Intelligence and Machine Learning. **04**
 - (c)** List and explain five components of problem definition in context of AI. **07**

OR

- Q.2**
- (c)** Explain how the agent interacts with the environment using appropriate illustrations. **07**
- Q.3**
- (a)** List and explain applications of breadth-first search **03**
 - (b)** List the advantages and disadvantages of the brute force Problem-Solving method. **04**
 - (c)** Differentiate between toy problem and real-world problem. Explain toy problem with suitable example. **07**

OR

- Q.3**
- (a)** Compare pros and cons of Branch and Bound algorithm. **03**
 - (b)** Explain Positive Sum game and Negative Sum game under non-zero sum games in brief. **04**
 - (c)** Explain Algorithm A*, Admissibility of A*, and Iterative Deepening A*. **07**
- Q.4**
- (a)** Write down any three major approaches to solve planning problems. **03**
 - (b)** How alpha-beta pruning can improve MIN MAX algorithm? Explain using suitable example. **04**
 - (c)** Explain in detail: Recursive best first search. **07**

OR

- Q.4**
- (a)** Define optimal path. Justify its importance. **03**
 - (b)** How means end analysis helps in solving complex problem, explain with suitable example. **04**

(c) Write a short note on Hill Climbing algorithm. Also discuss about drawback of hill climbing algorithm. **07**

Q.5 (a) Summarize and justify the role of natural language processing in modern AI. **03**

(b) Write a short note on parsing techniques used in AI. **04**

(c) Explain the concept of Heuristics in-game tree search. **07**

OR

Q.5 (a) Give a summary of steps involved in Natural Language Processing (NLP). **03**

(b) Explain transfer models in brief. What is its use in machine translation systems? **04**

(c) Explain the concept of text generation. List and explain Components of Natural Language processing in AI. **07**
