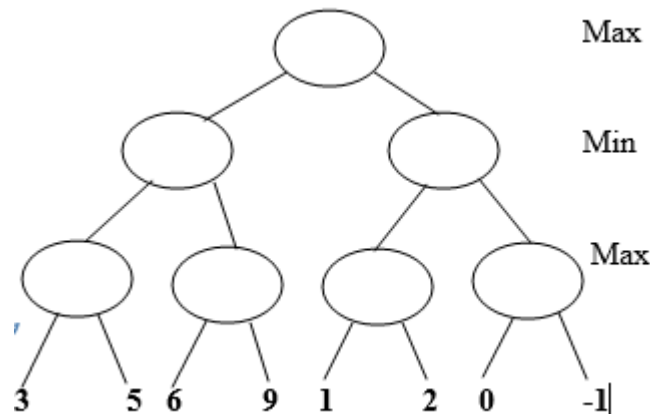


GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V EXAMINATION – WINTER 2025****Subject Code:3154202****Date:19-11-2025****Subject Name:Fundamentals of Artificial Intelligence****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

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.

MARKS

- Q.1**
- | | | |
|-----|--|-----------|
| (a) | Define Agent, Environment and Rationality. | 03 |
| (b) | Explain Goal Based Agent architecture with proper diagram. | 04 |
| (c) | List and explain applications of artificial intelligence. | 07 |
- Q.2**
- | | | |
|-----|--|-----------|
| (a) | What is Turing Test? | 03 |
| (b) | Differentiate Breath first search and Depth first search method. | 04 |
| (c) | Discuss A* algorithm. Also give one example to explain it. | 07 |
- OR**
- Q.3**
- | | | |
|-----|---|-----------|
| (c) | Explain AO* algorithm with an Example. | 07 |
| (a) | Discuss Min-Max search method. | 03 |
| (b) | Discuss hill climbing search method with its limitations. | 04 |
| (c) | What is alpha –beta cutoff? Apply and explain the same for the following example. | 07 |

**OR**

- Q.3**
- | | | |
|-----|---|-----------|
| (a) | Compare and contrast procedural and declarative knowledge. | 03 |
| (b) | Discuss briefly backward reasoning with example. | 04 |
| (c) | Discuss the different approaches to knowledge representation. | 07 |
- Q.4**
- | | | |
|-----|---|-----------|
| (a) | Explain Bay's theorem. | 03 |
| (b) | Explain any four fuzzy set operations with example. | 04 |
| (c) | Write about various defuzzification methods. | 07 |

OR

- Q.4** (a) Give the difference between Linear and logistic regression with appropriate equations. **03**
(b) Explain Decision Trees. **04**
(c) Sketch and explain fuzzy inference process. **07**
- Q.5** (a) Explain Overfitting and Underfitting in brief. **03**
(b) Explain Multilayer Perceptron. **04**
(c) How Does Back-Propagation in Artificial Neural Networks Work? **07**

OR

- Q.5** (a) What is sentiment analysis? Explain with example. **03**
(b) Discuss various activation functions used in Artificial Neural Network. **04**
(c) Explain steps of Natural Language Processing. **07**
