

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024****Subject Code:3161608****Date:02-12-2024****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 Artificial intelligence? Explain application of AI **03**
 (b) Explain AI problem characteristics in detail. **04**
 (c) Explain Water Jug Problem With Example. **07**
- Q.2** (a) Explain local maxima, plateau and ridge in brief **03**
 (b) Explain Best First Search with suitable example. **04**
 (c) Explain A* algorithm. What happens if h' underestimates h and overestimates h? **07**
- OR**
- (c) Define constraint satisfaction problem (CSP). How CSP is formulated as a search problem? **07**
- Q.3** (a) Define knowledge base agent in AI **03**
 (b) Translate these sentences into formulas in predicate logic. **04**
 1. John likes all kinds of food.
 2. Apples are food.
 3. Chicken is food.
 4. Anything anyone eats and isn't killed-by is food.
 5. Bill eats peanuts and is still alive.
 6. Sue eats everything Bill eats.
 (c) Explain Forward and Backward Chaining with example. **07**
- OR**
- Q.3** (a) Explain wumps world problem **03**
 (b) Describe the axioms of probability theory. **04**
 (c) Discuss Bayesian network and its applications **07**
- Q.4** (a) Explain the components of planning system. **03**
 (b) Explain the Alpha-Beta Cutoffs Procedure in Game Playing **04**
 (c) Discuss Iterative Deepening search. **07**
- OR**
- Q.4** (a) Discuss in brief the Hopfield network? **03**
 (b) Explain the fail and cut predicate in prolog programming with an example. **04**
 (c) Write a short note on statistical learning. **07**
- Q.5** (a) Discuss Bay's theorem. **03**
 (b) Write a prolog program to append two given lists into third **04**
 (c) Explain the MiniMax procedure in a two-player game with an appropriate example **07**
- OR**
- Q.5** (a) Explain Hierarchical Planning. **03**
 (b) Write a prolog program to count the number of elements present in the given list. **04**
 (c) What are the Applications, Features and Limitations of Prolog? **07**
