

**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.

<b>Q.1</b>	(a) What is Artificial intelligence? Explain application of AI	<b>03</b>
	(b) Explain AI problem characteristics in detail.	<b>04</b>
	(c) Explain Water Jug Problem With Example.	<b>07</b>
<b>Q.2</b>	(a) Explain local maxima, plateau and ridge in brief	<b>03</b>
	(b) Explain Best First Search with suitable example.	<b>04</b>
	(c) Explain A* algorithm. What happens if h' underestimates h and overestimates h?	<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 knowledge base agent in AI	<b>03</b>
	(b) Translate these sentences into formulas in predicate logic.	<b>04</b>
	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.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Explain wumps world problem	<b>03</b>
	(b) Describe the axioms of probability theory.	<b>04</b>
	(c) Discuss Bayesian network and its applications	<b>07</b>
<b>Q.4</b>	(a) Explain the components of planning system.	<b>03</b>
	(b) Explain the Alpha-Beta Cutoffs Procedure in Game Playing	<b>04</b>
	(c) Discuss Iterative Deepening search.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Discuss in brief the Hopfield network?	<b>03</b>
	(b) Explain the fail and cut predicate in prolog programming with an example.	<b>04</b>
	(c) Write a short note on statistical learning.	<b>07</b>
<b>Q.5</b>	(a) Discuss Bay's theorem.	<b>03</b>
	(b) Write a prolog program to append two given lists into third	<b>04</b>
	(c) Explain the MiniMax procedure in a two-player game with an appropriate example	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) Explain Hierarchical Planning.	<b>03</b>
	(b) Write a prolog program to count the number of elements present in the given list.	<b>04</b>
	(c) What are the Applications, Features and Limitations of Prolog?	<b>07</b>

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