

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- V EXAMINATION-SUMMER 2023****Subject Code: 3154202****Date: 23/06/2023****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.

		MARKS
Q.1	(a) State and Explain time and space complexity of depth-first-search and breadth-first-search.	03
	(b) Discuss following terms: Agents and Environment	04
	(c) What is overfitting? Discuss various methods to remove overfitting.	07
Q.2	(a) Explain working of AO* algorithm with an Example.	03
	(b) Discuss working of mini-max algorithm with an example.	04
	(c) Discuss with an example how 8-puzzle problem can be solved using A* Algorithm. Specify initial state, goal state, possible operations on empty tile and draw complete state space tree.	07
	OR	
	(c) Discuss with an example how Blocks world problem can be solved using Hill Climbing Algorithm. Specify initial state, goal state, possible operations and draw complete state space tree.	07
Q.3	(a) What do you mean by knowledge representation and mapping?	03
	(b) Compare forward and backward reasoning with example.	04
	(c) Discuss Bayesian Network with an example.	07
	OR	
Q.3	(a) Compare procedural and declarative knowledge.	03
	(b) What is non-monotonic reasoning? Explain.	04
	(c) Discuss Dempster-Shafer Theory.	07
Q.4	(a) Discuss following terms with one example of each: (i) Supervised Learning (ii) Unsupervised Learning (iii) Reinforcement Learning	03
	(b) Compare fuzzy sets and crisp sets. Discuss operations performed on fuzzy sets.	04
	(c) How K-NN can be used for classification and regression? Explain with one example for each.	07
	OR	
Q.4	(a) Discuss working of decision tree with an example.	03
	(b) What is cross validation ? Discuss its advantages and disadvantages.	04
	(c) Discuss application of fuzzy sets for control.	07
Q.5	(a) Explain different activation functions in Neural Networks.	03
	(b) Draw and Explain a Neural Network to represent AND and OR gates.	04
	(c) Discuss Syntactic Processing.	07
	OR	
Q.5	(a) Discuss Morphological Analysis.	03
	(b) Draw and Explain a Neural Network to represent XOR gates.	04
	(c) Explain Back Propagation Learning in Neural Networks.	07
