Seat No:_____ Enrollment No:_____

PARUL UNIVERSITY
FACULTY OF IT & COMPUTER SCIENCE
MCA/M.Sc.IT 2024-25 Mid-Term Examination

Semester: 2 **Date: 20-03-2025**
Subject Code: 05201294 **Time: (1hr:30min)**
Subject Name: Artificial Intelligence – 1 **Total Marks: 40**

Instructions:
1. Figures to the right indicate full marks.
2. Make suitable assumptions wherever necessary.

Q.1	**Answer the following.**	[10]
(a)	3 short questions of 1 mark each	[3]
	(i) Which AI type, currently nonexistent, aims to perform any intellectual task a human can?	
	(ii) What is the process of converting a problem into a search problem called?	
	(iii) In predicate logic, which symbol is used for universal quantification?	
(b)	Objective type/MCQs/True-False/Fill in blanks (7 questions of 1 mark each)	[7]
	1 What technique allows AI to deal with gray areas and uncertain outcomes? a) Heuristic Search b) Symbolic Reasoning c) Fuzzy Logic d) Statistical Analysis	
	2. Self-correction in AI means that algorithms continuously improve themselves for better accuracy. : True/False	
	3. Which search strategy guarantees the shortest solution? a) Depth-First Search b) Breadth-First Search c) Hill Climbing d) Generate-and-Test	
	4. A technique in AI that allows for reasoning with uncertainty and dealing with gray areas instead of absolute values is called _____.	
	5. Which AI technique is most useful for solving real-world problems using prior experience? a) Uninformed Search b) Heuristic Search c) Exhaustive Search d) None of the above	
	6. What is the primary goal of Machine Learning? a) To manually program every possible outcome b) To enable machines to learn from data and improve performance over time c) To replace traditional software entirely d) To make computers conscious like humans	
	7. In predicate logic, what does the existential quantifier (∃) mean? a) For all cases b) At least one exists c) Both a and b d) None of the above	
Q.2	**Answer the following.** (2 or 3 mark questions)	[10]
(a)	Two Questions of 2 Marks	[4]
	(i) Define Narrow AI with an example.	(02)
	(ii) What is a heuristic function? Provide an example.	(02)
(b)	Two Questions of 3 Marks	[6]
	(i) List and explain the four key aspects of AI programming.	(03)
	(ii) Define the term predicate logic in AI? Write brief detail with an example.	(03)

Q.3	**Attempt any TWO.**	**[10]**
	(i) Compare Narrow AI and General AI, highlighting their capabilities and limitations.	(05)
	(ii) Explain the key features of Machine Learning that differentiate it from traditional programming.	(05)
	(iii) Discuss in detail, How predicate logic used for knowledge representation in AI?	(05)
Q.4	**Answer the following.**	**[10]**
(a)	Consider an AI-based expert system for a hospital that diagnoses diseases based on patient symptoms. Explain how predicate logic can be used for knowledge representation in this system. Provide examples to demonstrate its application.	
(b)	Explain how an AI-based navigation system like Google Maps utilizes heuristic search techniques to determine the shortest route. Provide relevant examples. (Minimum 3 search techniques must explain with example)	(05)
	OR	
(b)	Heuristic search is faster but not always optimal. In what scenarios would you prefer using heuristic search over exhaustive search? Explain with examples.	(05)