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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S, FE) Examination June 2024 (2019 Scheme)

Course Code: AIT 307

Course Name: INTRODUCTION TO ARTIFICIAL INTELLIGENCE

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

		Marks
1	What is Artificial Intelligence? What are the foundations of AI.	3
2	Define Rational agent. Explain the same with the Vacuum cleaner problem	3
3	Write a note on the transition Model with respect to 8 puzzle problem	3
4	Explain the need for a heuristic function.	3
5	Explain the six elements of the adversarial search problem.	3
6	List the components of a Constraint Satisfaction Problem. Illustrate with an example.	3
7	What is an inference engine?	3
8	Differentiate between forward and backward chaining.	3
9	Differentiate between classification and regression.	3
10	What is meant by reinforcement learning? Give an example	3

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11	a)	What do you mean by PEAS? Discuss the properties of the task environment.	7
	b)	Explain various types of intelligent agents. state the limitation of each. and how it is overcome in other types of agents.	7
12	a)	Explain in detail how agents interact with the task environment.	7
	b)	Briefly discuss about different applications of AI.	7

Module -2

13	a)	Compare Greedy best First Search algorithm and A* search algorithm with performance measure with justification. Complete, Optimal, time and space complexity.	14

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14 a) With suitable examples explain Depth-first search and breadth-first search and state its advantages and disadvantages. 14

Module -3

15 a) Explain the MINI-MAX algorithm for two-player games using any tree, for the same tree indicate Alpha Beta pruning techniques. 10

b) Discuss local search in CSPs using the example of the 4-queens problem 4

16 a) Solve the following crypt arithmetic problem by hand, using the strategy of backtracking with forward checking and the MRV (Minimum Remaining Value) & least-constraining-value heuristics. 10

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b) Formulate the algorithm for Arc-Consistency. Explain with suitable examples 4

Module -4

17 a) Discuss in detail about steps involved in the Knowledge representation of propositional logic and first-order logic. 10

b) Write the PEAS description of the Wumpus world. 4

18 a) Consider the following sentences: 10

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.

Prove by forward chaining that "John likes peanuts "

b) What do you mean by unification? How it is useful in logic? 4

Module -5

19 a) Differentiate between Supervised and Unsupervised learning 10

b) Explain Ockham's razor principle 4

20 a) Explain learning in Decision Tree with example 7

b) How do we evaluate and choose the best hypotheses that fits the future data? Explain with a suitable method. 7

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