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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

July 2024 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 22EC5PE1AI **Max Marks: 100**
Course: Introduction to AI

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Discuss any two real-world applications of Artificial Intelligence in different sectors such as healthcare, finance, and transportation. How have these applications impacted society?	CO1	PO1	**10**
	b)	Analyze and explain the concept of Cognitive modeling and simulation in the context of Artificial Intelligence. How are these techniques used to develop and test AI algorithms? Provide examples.	CO3	PO2	**10**
		UNIT - II			
2	a)	Analyze the role of the predicate calculus in artificial intelligence and discuss its advantages in representing knowledge systems.	CO3	PO2	**10**
	b)	Discuss the concept of state space in the context of the 8-puzzle problem and analyse how it captures all possible configurations using "move blank" operations.	CO3	PO2	**10**
		OR			
3	a)	Compare and contrast the Data-Driven and Goal-Driven Search Strategies for State Space Search. How the decision is choosen between data- and goal-driven search.	CO3	PO2	**10**
	b)	Suppose you have 8L, 5L and a 3L bucket with you. The buckets have no measurement lines on them and you are asked to measure exactly 4L of water using the three buckets. How could you measure exactly 4L water using only those buckets? Illustrate with a step by step algorithm.	CO2	PO1	**10**
		UNIT - III			
4	a)	Analyze the A and A* algorithms for implementing best-first search. How do these algorithms optimize the search process in state space exploration? Explain any two processes.	CO3	PO2	**10**
	b)	In a survey of 250 television viewers. 88 like to watch news. 98 like to watch sports. and 94 like to watch comedy. 33 people like	CO2	PO1	**10**

			to watch news and sports. 31 like to watch sports and comedy. and 35 like to watch news and comedy. 10 people like to watch all three. Suppose a person from this group is picked at random: i. What is the probability that they watch news but not sports? ii. What is the probability that they watch news or sports but not comedy? iii. What is the probability that they watch neither sports nor news			
			OR			
	5	a)	Explain the significance of Hill Climbing and Dynamic Programming in heuristic search. Compare and contrast their problem-solving approaches and effectiveness	*CO2*	*PO1*	**10**
		b)	Describe the key properties of admissibility, monotonicity, and informedness in the context of heuristic search algorithms. Why are these properties important?	*CO1*	-	**10**
			UNIT - IV			
	6	a)	Analyze the challenges of integrating expert systems with other AI techniques such as machine learning and natural language processing, and discuss strategies for enhancing their performance.	*CO3*	*PO2*	**10**
		b)	Compare and analyse expert systems with traditional programming approaches, highlighting the advantages and limitations of using expert systems for problem-solving.	*CO3*	*PO2*	**10**
			UNIT - V			
	7	a)	Illustrate the basic principles of genetic algorithm and how it works.	*CO1*	-	**06**
		b)	Analyze the impact of population size on the performance of genetic algorithm.	*CO3*	*PO2*	**06**
		c)	Illustrate the fundamental principles of Ant Colony Optimization (ACO) and how it mimics the behavior of ants in nature. Apply ACO to solve a complex optimization problem and describe the steps involved in the optimization process.	*CO2*	*PO1*	**08**

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