VIT Vidyalankar Institute of Technology
Accredited A+ by NAAC
(Autonomous College Affiliated to University of Mumbai)

Weekly Test-1 (R-2022-C scheme) -(2023-24)

Date: 26/02/2024	Time: 1 Hr.	Branch: CMPN
Semester: VI	Subject: Artificial Intelligence	Marks: 30

Q. 1)	Attempt any Five (2 Marks Each)	CO	BL
a)	The "Rule Base" in an AI program is associated with: a. Storing historical data b. Defining the decision-making logic c. Managing system resources d. Processing sensory inputs	CO1	BL2
b)	What is the primary function of an Intelligent Agent in AI? a. Process user inputs b. Generate random outputs c. Act autonomously to achieve goals d. Store and retrieve data	CO1	BL1
c)	What distinguishes a Learning Agent from other types of agents? a. It can only perform predefined tasks b. It can modify its behavior based on experience c. It lacks the ability to interact with the environment d. It is not capable of autonomous action	CO2	BL1
d)	Which type of agent is designed to operate in dynamic and unpredictable environments? a. Simple Reflex Agent b. Model-Based Reflex Agent c. Goal-Based Agent d. Utility-Based Agent	CO2	BL2
e)	Which type of environment provides complete access to the entire percept history? a. Fully observable environment b. Partially observable environment c. Deterministic environment d. Stochastic environment	CO1	BL1
f)	In a stochastic environment, the next state of the environment is: a. Completely predictable b. Partially predictable c. Unpredictable d. Deterministic	CO2	BL2
g)	What is a characteristic of a deterministic environment? a. The next state is completely predictable b. The next state is partially predictable c. The next state is unpredictable d. The environment changes randomly	CO2	BL1
h)	The "Utility Function" in an Intelligent Agent is used to: a. Measure the agent's level of intelligence b. Evaluate the desirability of different states or outcomes c. Store and retrieve historical data d. Specify the agent's goals and objectives	CO2	BL1

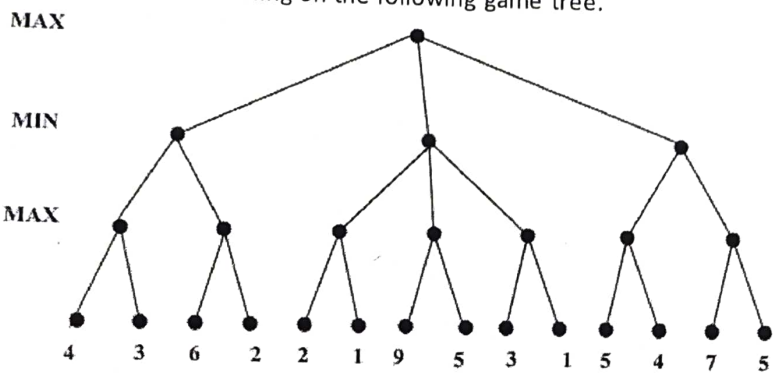
Q. 2)	Attempt any two. (5 Marks Each)		

a)	Describe a problem-solving agent.	CO3	BL1
b)	Elaborate problem formulation steps in AI	CO3	BL2
c)	Explain Learning Agent and give any example for the same.	CO2	BL1
Q 3)	Attempt any One (10 Marks Each)		
a)	The problem involves three water jugs with capacities of 8 liters (jug A), 5 liters (jug B), and 3 liters (jug C). The goal is to measure out exactly 4 liters of water. Follow the steps to find the solution in AI.	CO3	BL2
b)	Explain types of environments with examples	CO2	BL1

CO1	Ability to develop a basic understanding about components of AI, categorization of Intelligent Systems and new trends
CO2	Ability to understand the concept of rational agent, PEAS properties, task environment and types of intelligent agent.
CO3	Ability to choose an appropriate problem-solving method and searching technique.

Semester VI – CMPN - Mid Semester Assessment – II

Date: 18/03/2024	Artificial Intelligence	30 Marks/ 1 hour

			CO
1	**Solve any five (2 marks each)**		
	A	What is the primary characteristic of uninformed search algorithms? Explain.	CO3
	B	What are the main disadvantage of Depth-First Search (DFS)?	CO3
	C	In Uniform-Cost Search (UCS), how is the cost associated with each path handled?	CO3
	D	What is the key advantage of Iterative Deepening Depth-First Search (IDDFS) over pure Depth-First Search (DFS)?	CO3
	E	What is the admissibility property of a heuristic search?	CO3
	F	In the context of informed search, what does a heuristic function provide?	CO3
	G	Which informed search algorithm is guaranteed to find the optimal solution if the heuristic is admissible and consistent?	CO3
	H	In uninformed search, what does the term "blind search" refer to?	CO3
2	**Solve any one (10 marks each)**		
	A	Apply Alpha-Beta Pruning on the following game tree.  Provide the final choice path and explain the steps in the process.	CO3
	B	Solve the following 8 puzzle problem using Simple Hill Climbing Search. Initial State: 2 8 3 / 1 6 4 / 7 _ 5 Goal State: 1 2 3 / 8 _ 4 / 7 6 5	CO3
3	**Solve any one (10 marks each)**		
	A	Provide and explain with example the heuristic functions for the following AI problems. • Tic Tac Toe game • Blocks world problem • 8 Puzzle problem • 8 queens' problem	CO3
	B	Explain the steps used in Genetic algorithm with example	CO3

CO3	Ability to choose an appropriate problem-solving method and searching technique.

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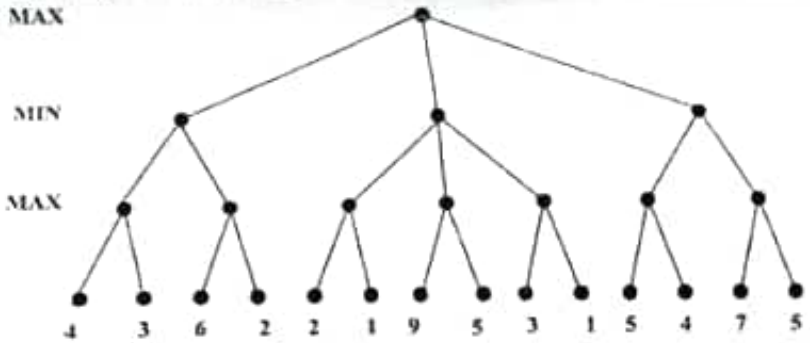
Semester VI – CMPN - Mid Semester Assessment – III

Date: 15/04/2024 | Artificial Intelligence | 30 Marks/ 1 hour

			CO
1	**Solve any five (2 marks each)**		
	A	How do you represent implications and biconditionals in propositional logic? Give example.	CO4
	B	What is the purpose of quantifiers in predicate logic?	CO4
	C	What is the result of the expression "~(P AND Q)" when both P and Q are true? (True / False), Justify.	CO4
	D	Represent the statement "For every integer x, if x is even, then x is divisible by 2" in predicate logic.	CO4
	E	Represent the negation of the statement "For all elements x, P(x) is true" in FOPL.	CO4
	F	What is the significance of representing logical expressions in Conjunctive Normal Form (CNF) within propositional logic?	CO4
	G	What is the negation of the statement "P ∨ Q" in propositional logic?	CO4
	H	What is the primary goal of applying propositional logic in artificial intelligence?	CO4
2	**Solve any one (10 marks each)**		
	A	Elaborate with examples on the different types of learning within the field of artificial intelligence?	CO5
	B	What are the steps to convert the FOPL statement to CNF. Write the CNF for the following statement? "Every one who loves all animal is loved by some one"	CO4
3	**Solve any one (10 marks each)**		
	A	Prepare the Partial Order Plan (POP) for the problem of Put On the pairs of shoes.	CO5
	B	Explain inferencing in Belief network with example.	CO4

CO4 Ability to analyze the strength and weaknesses of AI approaches to knowledge- intensive problem solving and knowledge representation technique.
CO5 Ability analyzes different planning and learning techniques to solve complex and realistic AI problems.

VIT Vidyalankar Institute of Technology Accredited A+ by NAAC (Autonomous College Affiliated to University of Mumbai)	End Semester Examination (CBCGS-C Scheme) -(2022-23)	
Date: 23/05/2023	Branch: Computer Engineering	Time: 2 Hrs.
Semester: VI	Subject: Artificial Intelligence	Marks: 50
N B :- All Questions are Compulsory		CO

Q.1)	Attempt any Five **(2 Marks Each)**	
a)	What is the importance of mutation step in genetic algorithm.	CO2
b)	Explain Alpha and Beta Parameters in Alpha-Beta pruning algorithm.	CO2
c)	Convert the following propositional statement to CNF. $(A \leftrightarrow B) \rightarrow C$	CO3
d)	Apply Skolemization on the following statement. "Someone is loyal to someone"	CO3
e)	Write and explain the formula for Joint Probability Distribution.	CO3
f)	Write equivalent FOPL statement for the following statement. "It is a crime for an American to sell weapons to a hostile nation"	CO3
g)	Write down the steps in the process of resolution by refutation.	CO3
h)	Explain limitations of propositional logic.	CO3
Q. 2)	Attempt any two. **(5 Marks Each)**	
a)	Explain quantifier operators supported in Predicate Logic with suitable example.	CO3
b)	Explain the inference rules used in forward reasoning and backward reasoning with suitable example.	CO3
c)	Prepare the Partial Order Plan (POP) for the problem of Put On the pairs of shoes.	CO4
Q 3)	Attempt anyone **(10 Marks Each)**	
a)	Apply Alpha-Beta Pruning on the following game tree. 	CO2
b)	Explain the steps used in Genetic algorithm with example.	CO2
Q 4)	Attempt anyone **(10 Marks Each)**	
a)	Explain Bayesian Belief network and how it is used for uncertain reasoning with example	CO3
b)	What are the steps to convert the FOPL statement to CNF. Write the CNF for the following statement: "Every one who loves all animal is loved by some one"	CO3
Q 5)	Attempt anyone **(10 Marks Each)**	
a)	Explain in detail the Expert System Architecture.	CO4
b)	Explain Types of learning with examples.	CO4