SREENIVASA INSTITUTE OF TECHNOGY AND MANAGEMENT STUDIES

(AUTONOMOUS)

Murukambattu, Chittoor

MCA DEPARTMENT

QUESTION BANK

For

24MCA124A -Artificial Intelligence

Regulation – 24

Academic Year 2024 – 25

Prepared by

Mr. N. P. Gangadhar, Assistant Professor

ISREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES.
(AUTONOMOUS)
MCA DEPARTMENT
QUESTION BANK

SUBJECT NAME : Artificial Intelligence **SUBJECT CODE : 24MCA124A**

YEAR &SEM : I & II **Academic Year : 2024-25**

UNIT I - INTRODUCTION:		
What is AI? - The History of Artificial Intelligence - The State of the Art. Intelligent Agents: Agents& Environments – Good Behavior: The Concept of Rationality –The Nature of Environments - Structure of Agents.		
PART –A		
Q.No.	**Questions**	**Blooms Taxonomy Level**
1.	Define Artificial Intelligence.	L1
2.	List out the four categories under which AI is classified	L1
3.	Identify the name of driverless car and first computer program to defeat the world champion in chess.	L1
4.	List out the characteristics of Intelligent agent.	L1
5.	How the agents will improve their performance?	L2
6.	What measure will evaluate the behavior of the Agent in an environment.	L2
7.	How to represent the environment of a problem.	L2
PART –B		
1.	Discuss about the historical developments of Artificial Intelligence.	L3
2.	Discuss about the state of the art of AI	L3
3.	Explain about the Agents and Environments in AI.	L4
4.	Explain about the Nature of Environment in AI	L3
5.	Discuss about Structure of agents with suitable diagrams.	L4
UNIT II - SOLVING PROBLEMS BY SEARCHING		
Problem Solving Agents – Example Problems- Searching for Solutions-Uninformed Search Strategies Informed (Heuristic) Search Strategies - Heuristic Functions. Beyond Classical Search: Local Search Algorithms and Optimization Problems- Local Search in Continuous Spaces- Searching with Nondeterministic Actions- Searching with Partial Observations .		
PART –A		
1.	List the five components of a problem.	L1
2.	Define search.	L1
3.	Compare the goal formulation and problem formulation.	L2
4.	How to represent the environment of a problem.	L2
5.	List out some of the uninformed search techniques.	L1
6.	List out some of the informed search techniques.	L1
7.	Compare the access method in uninformed search and informed search.	L2
8.	List the criterion used to compare the uninformed search strategies.	L1
9.	Define heuristic function.	L1
10.	What kind of problems can be solvable using local search algorithms.	L3
11.	Compare global minimum and global maximum.	L2
12.	Define Genetic algorithm.	L1
PART –B		
1.	Describe about Well-defined problems and solutions.	L3
2.	Explain about Searching for solutions	L3
3.	Discuss about Vacuum world problem	L3
4.	Explain about Heuristic functions.	L3

5.	Illustrate the Uninformed Search Strategies with examples.	L4
6.	Illustrate the Informed Search Strategies with examples.	L4
7.	Explain about Local Search Algorithms and Optimization Problems	L4
8.	Explain about local search in continuous spaces.	L4
UNIT III - CONSTRAINT SATISFACTION PROBLEMS		
Defining Constraint Satisfaction Problems- Constraint Propagation: Inference in CSPs- Backtracking search for CSPs. Logical Agents: Knowledge–Based Agent - The Wumpus World – Logic - Propositional Logic: a Very Simple Logic - Propositional Theorem Proving - Effective Propositional Model Checking - Agents Based on Propositional Logic.		
PART – A		
1.	What are the three main components of a CSP?	L1
2.	Give an example of a real-world CSP.	L1
3.	What is a binary constraint in CSPs?	L1
4.	What is constraint propagation?	L1
5.	What is arc consistency in CSPs?	L1
6.	What is node consistency?	L1
7.	What is path consistency?	L1
8.	What is the purpose of inference in CSPs?	L1
9.	What is backtracking search?	L1
10.	What is forward checking in backtracking search?	L1
11.	What is Knowledge base.	L1
12.	What are the components of knowledge based agent.	L1
13.	List the logical connectives.	L1
14.	What are the types of Quantifiers in first order logic	L1
15	What is propositional logic?	L1
16	Give an example of a propositional logic statement.	L1
17	What is the difference between a tautology and a contradiction?	L1
18	What are the basic logical connectives in propositional logic?	L1
19	What is a truth table?	L1
20	What is propositional theorem proving?	L1
PART –B		
1.	Explain the Constraint Satisfaction Problems with suitable example.	L3
2.	Explain about Inference in Constraint Satisfaction problems	L3
3.	What is backtracking search in CSPs? Explain the basic algorithm and discuss its strengths and weaknesses.	L3
4.	How does a knowledge-based agent use inference to make decisions? Provide examples to illustrate your answer.	L4
5.	Explain the role of percepts such as Breeze, Stench, and Glitter in the Wumpus World. How do these help an agent make logical inferences?	L4
6.	What is propositional logic? Explain its syntax, semantics, and use in AI with examples.	L4
7.	Explain the significance of logical connectives (AND, OR, NOT, IMPLICATION, BICONDITIONAL) in propositional logic. Provide truth tables for each.	L4
8.	What is propositional theorem proving? Explain its importance in AI and knowledge representation.	L4

9.	Explain the process of propositional model checking. How does it verify the truth of logical statements?	L4
10.	How do logical agents use propositional logic for decision-making? Explain with examples.	L4
UNIT IV – FIRST ORDER LOGIC		
Syntax and Semantic of First-Order Logic - Using First-Order Logic - Knowledge Engineering in First-Order Logic. **Inference in First Order:** Logic Propositional Vs First Order Inference-Unification and Lifting-Forward Chaining-Backward Chaining Resolution.		
PART – A		
1.	What is the syntax of First-Order Logic (FOL)?	L1
2.	What is the semantics of FOL?	L1
3.	How does FOL differ from propositional logic?	L1
4.	What are predicates in FOL?	L2
5.	What is knowledge engineering in FOL?	L2
6.	What is the role of a knowledge base in FOL?	L2
7.	What is unification in FOL?	L3
8.	What is lifting in the context of FOL?	L3
9.	What is forward chaining?	L4
10.	What is backward chaining?	L4
11.	What is resolution in FOL?	L5

PART – B		
1.	Explain the syntax and semantics of First-Order Logic (FOL). Provide examples to illustrate your explanation.	L1
2.	Discuss how First-Order Logic is utilized in Artificial Intelligence for knowledge representation and reasoning.	L2
3.	Describe the process of knowledge engineering using First-Order Logic. What are the key steps involved in building a knowledge base.	L3
4.	Discuss the concepts of unification and lifting, and explain how they enhance inference capabilities in FOL.	L4
5.	Explain the forward chaining and backward chaining inference techniques in First-Order Logic.	L5
6.	Compare and contrast inference mechanisms in propositional logic and First-Order Logic.	L6
UNIT V – KNOWLEDGE REPRESENTATION:		
Ontological Engineering - Categories and Objects - Events- Reasoning Systems for Categories - Reasoning with Default Information - The Internet Shopping World. Quantifying Uncertainty: Acting Under Uncertainty - Basic Probability Notation - Inference Using Full Joint Distributions – Independence - Bayes' Rule and Its Use.		
PART – A		
1.	What is ontological engineering in AI?	L1
2.	Define 'categories' and 'objects' in knowledge representation.	L1
3.	What are 'events' in the context of AI?	L1
4.	Explain reasoning systems for categories.	L1
5.	What is reasoning with default information?	L2
6.	Describe the 'Internet Shopping World' in AI.	L2
7.	What does 'acting under uncertainty' mean in AI?	L2

SUBJECT NAME : Artificial Intelligence **SUBJECT CODE : 24MCA124A**

YEAR &SEM : I & II **Academic Year : 2024-25**

8.	Define basic probability notation.	L2
9.	What is a full joint probability distribution?	L2
10.	Explain the concept of independence in probability.	L2
11.	What is Bayes' Rule and its significance in AI?	L2
	PART – B	
1.	Explain the concept of ontological engineering in Artificial Intelligence.	L1
2.	Discuss the role of categories and objects in knowledge representation. How do they facilitate reasoning in AI systems?	L1
3.	What are events in the context of AI, and how are they represented and utilized in reasoning systems?	L1
4.	Explain reasoning systems for categories. How do they support inference in AI applications?	L2
5.	Describe reasoning with default information. How do AI systems handle exceptions to default assumptions?	L2
6.	Illustrate the concept of the 'Internet Shopping World' as a domain in AI. How does ontological engineering apply to this domain?	L2
7.	What does 'acting under uncertainty' entail in AI, and why is it significant?	L3
8.	Explain the concept of a full joint probability distribution. How is it utilized in AI inference?	L3
9.	What is Bayes' Rule, and how is it applied in AI systems for updating beliefs?	L3