



Parul Institute of Technology, Limda, Vadodara

Subject with Code: AI(303105307)

Course & Branch: B.Tech- AI

Year & Sem: III-B.Tech & V-Sem

QUESTION BANK (DESCRIPTIVE)

Unit 1: Introduction

1. What is Artificial Intelligence (AI)?
2. Identify and describe the major areas of AI.
3. List and explain various AI techniques.
4. Outline the historical development of AI.
5. What are some common problems in AI?
6. Describe production systems in the context of AI.
7. Discuss the characteristics of problems that AI aims to solve.
8. Define an intelligent agent.
9. Describe the architecture of an intelligent agent.
10. How is AI applied in e-commerce? Describe the use of AI in medicine.
11. Explain different types of Artificial Neural Network.
12. Explain AI representation and its properties.
13. Discuss the future scope of AI.
14. What are the common issues in designing search algorithms?
15. Provide an overview of various AI problems and applications.



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Regulation:

Unit 2: Search Techniques

1. Explain the generate-and-test method.
2. Describe the hill climbing search technique.
3. What is best-first search?
4. Discuss the problem reduction technique.
5. Explain constraint satisfaction problems.
6. Describe means-ends analysis.
7. Define heuristic search.
8. Compare hill climbing and best-first search.
9. Discuss mean and end analysis.
10. Explain constraint satisfaction in detail.
11. Describe the A* algorithm and its applications.
12. Explain the AO* algorithm and its use cases.
13. What are the basic concepts of knowledge representation?
14. Discuss different knowledge representation paradigms.
15. Explain propositional logic.
16. List and explain inference rules in propositional logic.
17. How is knowledge represented using predicate logic?
18. Define predicate calculus.
19. Explain predicates and arguments.
20. Describe the ISA hierarchy.
21. How can a problem be defined as State Space Search? Explain with a suitable example.
22. Briefly explain the concept of a heuristic function in search algorithms. How does it affect the search process?
23. What is the AO* algorithm, and how does it differ from traditional search algorithms like A*?
24. Explain Best First Search algorithm with a suitable example?
25. Explain Constraint satisfaction with a suitable example?
26. Demonstrate the technique of Means-End Analysis with an example. Discuss its potential applications along with disadvantages in detail.



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Unit 3: Knowledge Representation

1. What is knowledge representation? Discuss representation and mappings.
2. Describe different approaches to knowledge representation.
3. Identify issues in knowledge representation.
4. Explain how simple facts are represented in predicate logic.
5. How are instances and ISA relationships represented in knowledge systems?
6. What are computable functions and predicates?
7. Describe the resolution process in logic.
8. Explain representation and inference in propositional logic.
9. Discuss various reasoning patterns.
10. Describe the resolution method in logical reasoning.
11. How is information represented in first-order logic?
12. Explain inference in first-order logic.
13. Discuss reasoning patterns and resolution in first-order logic.
14. Explain Inference Rules.
15. Explain how a Bayesian network can be used to represent uncertain knowledge.
16. Describe the difference between propositional logic and first-order logic. Give an example of each.
17. Give the logical translation of the statement: "None of my friends are perfect." [Hint: Use predicate logic]. List any three inference rules in predicate logic.
18. Define classification and list the common types of classification algorithms used to solve various real-world problems in machine



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Unit 4: Uncertainty

1. What is non-monotonic reasoning? Explain it with an example.
2. Describe logics for non-monotonic reasoning.
3. Explain forward rules and backward rules.
4. What are justification-based truth maintenance systems?
5. Describe semantic nets.
6. Explain statistical reasoning.
7. Discuss the concepts of probability and Bayes' theorem.
8. Explain Bayesian networks.
9. Describe Markov networks.
10. Explain the hidden Markov model.
11. Discuss the basis of utility theory and utility functions

Unit 5: Fuzzy Sets and Fuzzy Logic

1. What are fuzzy set operations?
2. Explain membership functions in fuzzy logic.
3. Define fuzzy logic.
4. What are hedges in fuzzy logic?
5. Describe fuzzy propositions and inference rules.
6. Explain the components and functioning of fuzzy systems.
7. Discuss two applications of fuzzy logic in real-world problems



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Unit 6: Natural Language Processing

1. Provide an introduction to natural language processing (NLP).
2. Explain syntactic processing in NLP.
3. Discuss semantic analysis in NLP.
4. What is discourse processing in NLP?
5. Describe pragmatic processing.
6. Explain spell checking in NLP systems.
7. Explain steps of Natural Language Processing?

Unit 7: Neural Networks and Expert Systems

1. Provide an introduction to neural networks.
2. Explain perception and qualitative analysis in neural networks.
3. Describe the architecture of neural networks.
4. Discuss various applications of neural networks.
5. Explain the utilization and functionality of neural networks.
6. What is the architecture of an expert system?
7. How is knowledge represented in expert systems?
8. Provide two case studies on expert systems, highlighting their architecture, knowledge representation, and applications.