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Artificial Intelligence Important Questions PDF

The most important Artificial Intelligence questions are the definition and history of AI, intelligent agents and PEAS, problem formulation, BFS, DFS and uniform cost search, heuristic search with A* and hill climbing, constraint satisfaction, minimax and alpha-beta pruning, propositional and first-order logic, resolution and unification, Bayes' theorem and Bayesian networks, and basic machine learning ideas such as decision trees and neural networks.

Key takeaways

- A*, minimax with alpha-beta pruning and resolution proofs are the most common numericals.
- Learn PEAS descriptions and agent types with one example each.
- Convert English sentences into first-order logic step by step.
- These are practice questions, not past papers; check your own syllabus and official previous papers.

About these important questions

This page lists the most important Artificial Intelligence questions for B.Tech CSE and IT exams, arranged unit by unit. The units follow the standard syllabus that most Indian technical universities share, so the order may differ slightly from yours.

Please note: these are practice questions based on common syllabus topics. They are not verified past papers, and we do not claim that any question will appear in your exam. Check your own university syllabus first, then solve the official previous year papers. AKTU students can download them from the AKTU old question paper archive.

Unit 1: Introduction and Intelligent Agents

Covers AI definitions, history, applications, agents and environments.

Short questions (2 marks)

- Define artificial intelligence.
- What is the Turing test?
- What is a rational agent?
- Give the PEAS description of an automated taxi.

Long questions

1. Explain the four approaches to AI (thinking and acting, humanly and rationally).
2. Explain the types of agents: simple reflex, model-based, goal-based, utility-based and learning agents, with diagrams.
3. Explain the properties of task environments (observable, deterministic, episodic, static, discrete, single-agent).
4. Explain the applications of AI in healthcare, finance and transport.
5. Explain the history of AI in brief.

Unit 2: Problem Solving and Search

Covers problem formulation, uninformed and informed search, and local search.

Short questions (2 marks)

- Define a state space.
- What is an admissible heuristic?
- Differentiate between BFS and DFS.

Long questions

1. Formulate the 8-puzzle, water jug or missionaries and cannibals problem as a search problem.
2. Explain BFS, DFS, uniform cost search, depth-limited and iterative deepening search, with their completeness and complexity.
3. Apply A* search on a given graph with heuristic values and find the optimal path.
4. Explain hill climbing and its problems (local maxima, plateaus, ridges), and simulated annealing.
5. Explain constraint satisfaction problems with map colouring, and backtracking with forward checking.

Unit 3: Adversarial Search and Game Playing

Covers game trees, minimax and alpha-beta pruning.

Short questions (2 marks)

- What is a zero-sum game?
- Why is alpha-beta pruning useful?

Long questions

1. Explain the minimax algorithm and apply it to a given game tree.
2. Apply alpha-beta pruning to a game tree and show which branches are pruned.
3. Explain the effect of move ordering on alpha-beta pruning.
4. Explain evaluation functions and cutting off search.
5. Explain stochastic games and expectiminimax in brief.
6. Compare game playing with search problems, and explain why a chess program cannot search the full game tree.

Unit 4: Knowledge Representation and Reasoning

Covers propositional logic, first-order logic, inference and other representation methods.

Short questions (2 marks)

- Differentiate between propositional and first-order logic.
- What is unification?
- Differentiate between forward and backward chaining.

Long questions

1. Convert English sentences into first-order logic, then into clausal (CNF) form.
2. Prove a goal using resolution refutation, for example "Marcus was a man … Did Marcus hate Caesar?"
3. Explain forward chaining and backward chaining with examples.
4. Explain semantic networks, frames and scripts.
5. Explain the Wumpus world and how logic is used in it.

Unit 5: Uncertainty and Learning

Covers probabilistic reasoning and an introduction to learning. Some universities add expert systems or NLP here.

Short questions (2 marks)

- State Bayes' theorem.
- What is a Bayesian network?
- Differentiate between supervised and unsupervised learning.

Long questions

1. Solve a numerical using Bayes' theorem, such as a medical test with given accuracy.
2. Explain Bayesian networks and compute a joint probability from a small network.
3. Explain fuzzy logic and membership functions.
4. Explain learning from examples with decision trees, and how to choose attributes using information gain.
5. Explain the perceptron and a basic neural network.
6. Explain the architecture of an expert system.

Sample answer outline: A* search on a graph

A* is one of the most repeated numericals. Answer it in this order:

1. **Define A.* It is an informed search that expands the node with the lowest f(n) = g(n) + h(n), where g(n) is the cost from the start and h(n) is the estimated cost to the goal.
2. **State the condition for optimality.** If h(n) is admissible (never overestimates) the tree search version is optimal. For graph search, h(n) should also be consistent.
3. **Trace the search in a table.** Columns for step, node expanded, open list with f values, and closed list. Start with the start node, expand the lowest f each time, and update a node's f if a

cheaper path is found.
4. **Stop at the goal.** A* stops when the goal is selected for expansion, not when it is first generated. Say this, because it is a common mistake.
5. **Write the path and its cost.** Trace back through the parent of each node.
6. **Add complexity.** Time and space are exponential in the worst case, and the quality of h(n) decides how many nodes are expanded.

Marks weightage and how to write answers

A common pattern, used by AKTU and many other universities, has a compulsory short-answer section that covers every unit, followed by long-answer questions with a choice inside each unit. Marks per question change between universities and years, so confirm the scheme on a recent official paper.

- **Short answers (about 2 marks):** a crisp definition, one example or diagram, and nothing more. Three to five lines is enough.
- **Long answers (7 to 10 marks):** start with a definition, add a labelled diagram or table, explain the steps, and finish with an example, advantages or a comparison.
- For search and game tree questions, draw the tree and a step table. Marks come from the steps, not only the final path.
- For resolution, number each clause and show which two clauses you resolve at every step.

A 7-day revision plan for Artificial Intelligence

1. **Days 1 to 5:** one unit a day. Read your notes, then write the long answers for that unit from memory and check them against your notes.
2. **Day 6:** redo one A* search, one minimax tree with alpha-beta pruning, one resolution proof and one Bayes' theorem numerical.
3. **Day 7:** solve one full official previous year paper in three hours, then check which units cost you time.

Keep a single sheet of formulas, definitions and diagrams for the last hour before the exam.

Frequently asked questions

Which Artificial Intelligence topics are most important?

Intelligent agents and PEAS, uninformed and informed search (especially A*), hill climbing, minimax and alpha-beta pruning, first-order logic and resolution, and Bayes' theorem are asked most often.

How do I solve alpha-beta pruning questions?

Work left to right, depth first. Pass alpha (best for MAX) and beta (best for MIN) down the tree, update them as values come back, and prune a branch as soon as alpha is greater than or equal to beta. Mark pruned branches clearly.

Is this subject enough to start a career in AI?

It gives the theory base. For jobs, add Python, machine learning, deep learning and project work, since employers look for practical skills.

Are these Artificial Intelligence questions from previous year papers?

No. They are practice questions built from topics that appear in most B.Tech Artificial Intelligence syllabi. Use them with your own university's official previous papers, for example the AKTU archive at https://aktu.ac.in/old-question-paper.html.

Is this PDF free?

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Sources and further reading

- AKTU: old question papers (official archive)
- Artificial Intelligence: A Modern Approach (Russell and Norvig), official site
- NPTEL: online courses from IITs (search for Artificial Intelligence)

About this PDF

These are practice questions for revision, prepared by the Uncodemy trainer team from common B.Tech syllabus topics. They are not past papers, a certificate or a promise of marks. Spot an error? Write to info@uncodemy.com and the team will review it.

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