

1. What is the definition of a non-observable environment? What is an appropriate agent architecture in such an environment? (4p)
2. What are the formal parts of a single-state problem formalization? (4p)
3. Define the following concepts: accessible (ADMISSIBLE) heuristics, monotonic heuristics, dominant heuristics, branching factor, effective branching factor. (12p)
4. Apply (a) the depth-first search, (b) the uniform-cost search, and (c) the greedy search from state A and determine the resulting goal state (goal states are denoted with double circles). For each search method describe its main properties (time complexity, space complexity, completeness, optimality). (10p)
5. Compare the deductive and abductive inference. How and when can we use them? (5p)
6. The \forall , \exists , \rightarrow , \leftrightarrow , \wedge symbols are not present in clauses in conjunctive normal form. Describe their elimination (5p).
7. The DARII syllogism is as follows:
$$\begin{array}{l} \forall x. B(x) \rightarrow A(x) \\ \underline{\exists x. C(x) \wedge B(x)} \\ \hline \exists x. C(x) \wedge A(x) \end{array}$$

Proof its validity by resolution. (10p)
8. What is the „frame problem“? (3p)
9. What is promotion and demotion in planning? Given an example! (7p)

