2  Artificial Intelligence (sbh11)

(a) Describe the state-variable representation for planning by discussing the following, giving specific examples of each concept:

(i) Rigid relations and state variables. [2 marks]

(ii) Actions. [2 marks]

(iii) The representation of state. [2 marks]

(iv) Goals and solutions. [2 marks]

(b) Your boss has suggested using heuristic search to solve a planning problem expressed in the state-variable representation. Explain how this might be achieved. You do not need to suggest a specific heuristic at this stage. [3 marks]

(c) Comment on whether or not heuristic search is a good approach to solving planning problems in the state-variable representation, compared with the alternative of using a constraint satisfaction solver. [5 marks]

(d) Suggest an admissible heuristic that could be used when applying A* search to solving a planning problem in the state-variable representation. Show that it is admissible. [4 marks]