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 $A^\star$ search to solving a planning problem in the state-variable representation. Show that it is admissible. [4 marks]