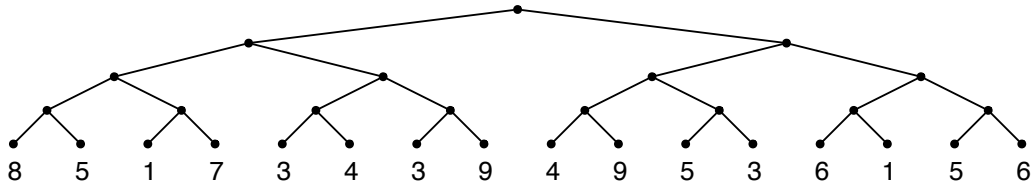
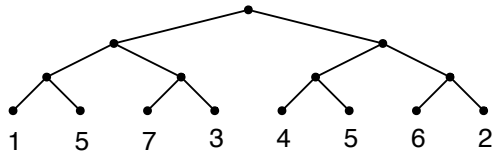
3. (a) Describe the minimax algorithm and list the assumptions that are made. [3]

(b) Consider the following adversarial search tree, where the first player is the maximising player. Use the minimax algorithm to determine which move the first player should choose, and what utility they should expect. You should show the resulting search tree. [4]



(c) Describe the alpha-beta pruning algorithm and show how it operates on the following tree, again assuming that the first player is the maximising player. State which move the first player should choose. [4]



(d) i. Describe how a cut point can be chosen for the depth-first search of the game tree, as carried out by the minimax algorithm. [4]

ii. Explain the horizon problem that is potentially faced when using such a cut point. How can this be avoided? [4]

(e) Local search algorithms are a special type of search. How does a local search differ from more general search techniques? [1]

(f) Suppose that you been asked to fine tune the control system of an autonomous drone. Describe a genetic algorithm could be used to find the best values for the set of parameters that control the drone. You should include in your answer an explanation of crossover and mutation. [5]