1 Graph Search Strategies

a) Depth-First Search
   States Expanded: Start, A, C, D, B, Goal
   Path Returned: Start-A-C-D-Goal

b) Breadth First Search
   States Expanded: Start, A, B, D, C, Goal
   Path Returned: Start-D-Goal

c) Uniform-Cost Search
   States Expanded: Start, A, B, D, C, Goal
   Path Returned: Start-A-C-Goal

d) Greedy search
   States Expanded: Start, D, Goal
   Path Returned: Start-D-Goal

e) A* search
   States Expanded: Start, A, D, B, C, Goal
   Path Returned: Start-A-C-Goal

2 Search Racer!

a) At each state, you have a location and the velocity. There are \( L \) locations and there are \( V + 1 \) possible velocities. Therefore, we have at most \( L(V + 1) \) states. The exact number of states is less than this, but the reachability is ignored as stated in the problem.

b) 3. At each state, you have an option to accelerate, decelerate, or stay; each will lead to one exact next state.

c) No, it is not admissible. The racer can move more than one square per action, so the number of remaining actions may be less than the distance to the exit.

d) \[
\frac{\text{distance to the exit}}{V}
\]

   At each step, you can go at most \( V \) steps.

e) No, the completeness of the search will stay the same. In general, inadmissible heuristics do not affect search completeness, but optimality.