3.8 (a)

Answer: because if there are arbitrary negative path costs, any unvisited node, which might hold a value negative enough, can bring advantage to a search path to be the optimal path by appending the negative-valued node itself to the search path.

39 (a)

Initial state – three missionaries and three cannibals on one bank of a river along with a boat

Actions – ship one or two of the missionaries and cannibals from one to the other side of the river

Transition model – returns the resulting state as per the given state and actions

Goal test – checks whether all the missionaries and cannibals are on the other bank of the river.

Path cost – the cost is the number of shipments where each shipment is of cost 1

39 (b) Implement and solve the problem optimally using an appropriate search algorithm. Is it a good idea to check for repeated states?

3.13

3.21

Create a small example of your own and follow the A\* algorithm on non-admissible heuristic to see what the output is. Is the output optimal?

Note question 3.9 is in fact a programming question, although the original question asks you to implement a solution using one algorithm, you should try at 3 different search algorithms and compare their performance. In your submission, you should report the algorithms implemented and show the performance comparison.