Python code that implements the coding questions can be found at:
http://artint.info/code/python/aipython_322_as3_sol.zip

Question One

We have four vars HC, BH, GD, RA. The domains are the locations.

It is possible to have the domains being all of the locations, and have domain constraints, but it is probably simpler to have it domain consistent initially. Thus the domains of HC and BH is {02, 20, 21, 22}. The domain of RA is {01, 02, 11, 21, 22}. The domain of GD is {10, 20}.

There are pairwise constraints saying each variable is different. For the other constraints see the AIspace representation at:
http://www.cs.ubc.ca/~poole/cs322/2018/as3/322as3q1.xml
load this link into the AIspace CSP applet.

There are 4 solutions. They all have RA at 1,1 and the GD us either ar 10 or 20 and one of HC and BH is at 02 and the other is at 22.

Question Two

See:
There are two solutions and 1241 failing branches (with 1657 nodes expanded).


To find a small tree, a good heuristic is to always choose the most constrained variable. This is the variable that is in the most constraints with other variables. Another good heuristic is to prefer the one that is in the most constraints with previous variables in the ordering, and to break ties by choosing the variable that is in the most constraints.

You get a bonus mark for having a non-uniform tree. That is, where which variable chosen depends on the context. You could possibly do better than the 74 failing branches. (Just as Figure 4.1 in the textbook is smaller than any static ordering.)

Question Three

It should not have taken more than a few hours. Most of this should have been in understanding the material, not in doing busy work. I hope it was reasonable, and you learned something.