Name: _____ **CCID:** _____

CMPUT 355 Quiz #4 **20 marks** **50 minutes** **closed-book** **no devices**

1. (a) **[2 points]** What is the minimax value for Black of the 2×2 Go position after the move `1.B[pass]`? Explain your answer. Assume positional superko, no suicide, and 0 komi.

   (b) **[3 points]** Construct a proof tree that proves that the minimax value for 1×2 Go (*not* 2×2) is no larger than 0.

2. (a) **[2 points]** Is the Nim position `(2, 2, 3)` a winning or a losing position? Why?

   (b) **[2 points]** Is the Nim position `(2, 2, 3, 3)` a winning or a losing position? Why?

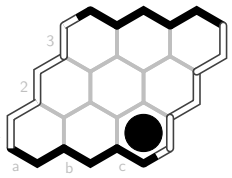
   (c) **[3 points]** List all the winning moves from the Nim position `(1, 5, 5)`.

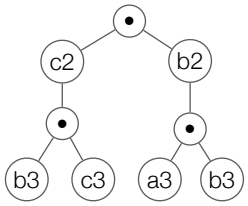
3. Consider the following AND/OR strategy after `1.B[c1]` on the 3×3 Hex board:

   (a) **[2 points]** What are this strategy's *cell sets*?

   $$(c2 \wedge (b3 \vee c3)) \vee (b2 \wedge (a3 \vee b3))$$

   (b) **[2 points]** Does this strategy guarantee a win for Black from this position? Why or why not?





4. **[4 points]** Consider the following 6×6 Hex position. For each pair of nodes below, indicate whether they are **F**ully connected, **S**emi-connected, or **N**ot virtually connected:

node 1	**node 2**	**virtually connected?**
$a3$	$b4$	
$a3$	$c1$	
$c1$	$f1$	
$b4$	$f1$