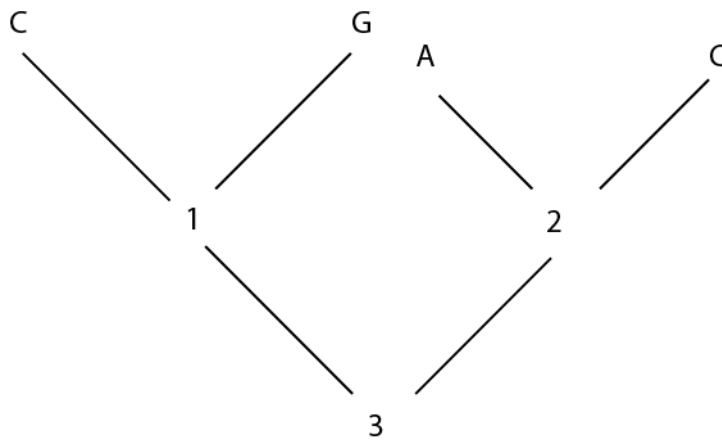


Biology 545 Exam I – Spring XXXX

Name: _____

- 1) Why did pheneticists criticize evolutionary taxonomists in the early 1960's (7 pts.)? Do you think those criticisms are justified (2 pts.)? Why or why not (6 pts.)?

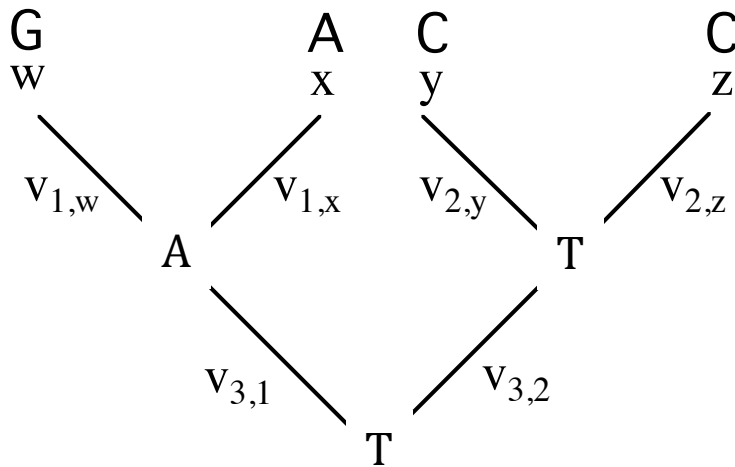
- 2) Use Fitch optimization to find the number of steps on this tree. Show all state sets and accumulated lengths (21 pts.).



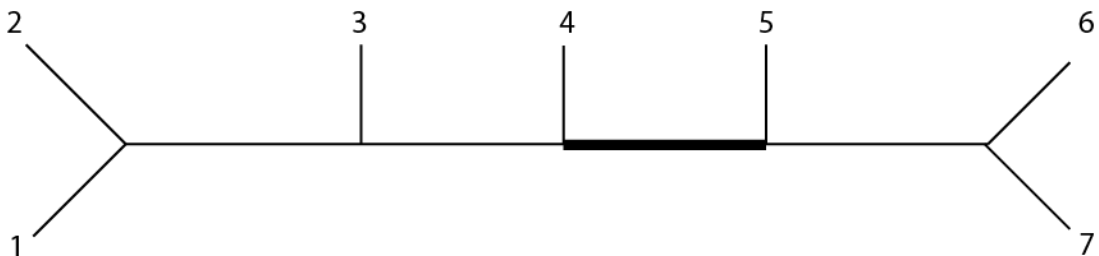
3) Please define long-branch attraction and what causes it (10 pts.).

4) Is Neighbor-Joining phenetic (4 pts)? Why or why not (8 pts.)?

5) Please write the likelihood function for the tree and reconstruction shown below (18 pts.).



6) For the tree shown, draw the two NNI rearrangements of the thick branch (12 pts.). How many such rearrangements are there for this tree (4 pts.).



7) What are the advantages and disadvantages of model-based alignment as implemented by BAliPhy (8 pts.).