

Biology 545 Exam II – Spring 2021

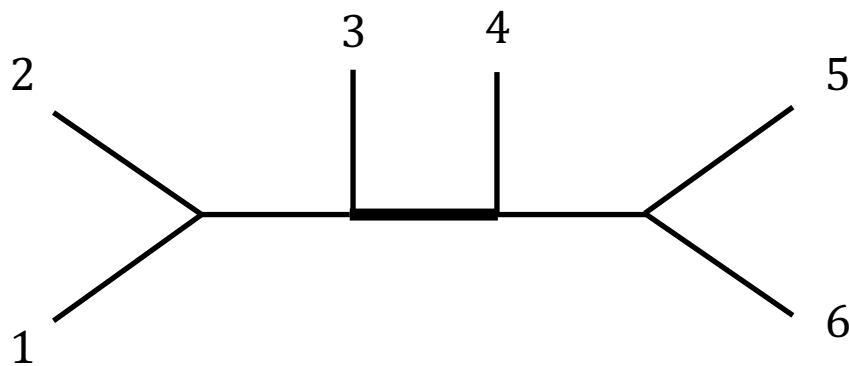
Name: _____

1) What are the assumptions of the JC model of nucleotide substitution (10 pts.)?

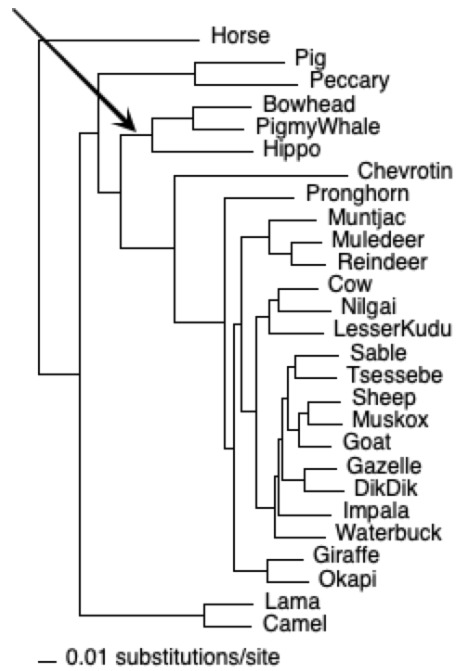
2) Please explain how the HKY+I model is a special case of GTR+I+ Γ (20 pts.). Please be sure to refer to the parameters of each.

3) Please write the equation for the AIC (8 pts.). Also, describe both a simple description of the criterion and a more detailed justification for it (8 pts.).

4) Please show the two NNI swaps for the internal branch in bold (16 pts.)



5) Let's assume you have estimated the following topology:



The node indicated by the arrow has a nonparametric bootstrap value of 98, a decay index of 42 and a posterior probability of 1.0. Interpret each of these measures of nodal support (18 pts.).

6) We described issues that some folks have with identifiability of I+ Γ models of among-site rate variation. Please indicate what we meant by this and how it can be dealt with (20 pts.)?