Problem Set 2

Please indicate the parameters of an HKY-SSR$_5$ model.

Use the character-by-taxon matrix below to demonstrate why one should never map characters onto a strict consensus tree.

A	0 0 0 1 0 0
B	1 0 1 0 0 0
C	0 1 0 1 1 1
D	0 1 0 1 1 1
E	1 1 1 1 1 0

Please draw a likelihood surface for two trees where one has a higher joint likelihood with respect to p_{invar} and the other has a higher marginal likelihood.

Please write the formula for the AIC and provide a simple justification and its theoretical justification.

What it the difference between consistency and efficiency?

Why should the GTR+CAT model used in RAxML only be used for very large data sets?

Please write Bayes' Theorem for the posterior distribution of trees.