Questions for Evolution 370 Exam 1 Review 2014

No derivations, No knowledge of historical figures, all equations provided

Explain segregation and independent assortment

Chapter 1 (HIV)

Why is CCR5 deletion not spreading throughout the world?

Explain how HIV evolves competitive ability (Fig. 1.18)

How can you predict which aa will evolve in AZT

Chapter 2 (Patterns of Evolution)

How is complexity related to natural selection in terms of the ID argument?

Why is the blood clotting example interesting?

Chapter 3 (Evidence for Natural Selection)

Explain parallelism vs. convergent, both are examples of homoplasy

reversals also happen and can lead to homoplasy

Go through the Galapagoes Finch story

Chapter 4 (Constructing trees)

Explain difference between phonetics and cladistics, homology, synapomorphy, parsimony trees, homoplasy

Go through how to build a tree, use an example

Explain monophyly and paraphyly and especially how it relates to taxonomy which should reflect evolutionary branching process use a tree to explain

What was the point of the Chameleon example

Chapter 5 (Mutation)

explain orthologs vs paralogs

Discuss chromosome inversions and relationship to adaptation go through crossing over supression

how does ploidy evolution prevent gene flow

Why do plants evolve polyploidy (because they are able to self)

Difference between nonfunctional and pseudogenes (none really), how does this happen?

Inversions?

Chapter 6 (NS, HW, mutation-selection balance)

Define fitness and selection; How would one measure fitness?

Real life example of selection acting against a recessive allele

Go through why you have equilibrium frequencies (Het adv, Freq. Dependency)

What are the mechanisms underlying overdominance (a little bit of a bad thing can be helpful)

Underdominance and speciation

s1 vs s2, for heterozygote advantage (s1 refers to first homozygote, s2 second)

More examples of use of HW, selection, selection mutation balance

What are the mechanisms underlying frequency dependent selection?

How do you use mutation-selection balance to determine if there is overdominance

Use of equation to determine how many generations it takes to reduce a lethal recessive allele’s frequency