Evolution Unit Exam Practice Essay Questions

1. **Discuss** TWO prezygotic isolating mechanisms that prevent hybridization between two species. Include in your discussion an example of each mechanism.

2. Charles Darwin proposed that evolution by natural selection was the basis for the difference that he saw in similar organisms as he traveled and collected specimens in South America and on the Galapagos Islands.

1. Explain the theory of evolution by natural selection as presented by Darwin.
2. Each of the following relates to an aspect of evolution by natural selection. Explain three of the following:
   * 1. Convergent evolution and the similarities among species in a particular environment.
     2. Natural Selection and the formation of insecticide resistant insects or antibiotic resistant bacteria.
     3. Speciation and isolation
     4. Natural selection and heterozygote advantage.

3. What requirements must be met for a population in Hardy – Weinberg equilibrium?

4. The compound phenylthiocarbamide (PTC) tastes very bitter to most persons. The inability to taste PTC is controlled by a single recessive gene. In the American white population, about 70% can taste PTC while 30% cannot (are non-tasters). Estimate the frequencies of the Taster (T) and non-taster (t) alleles in this population as well as the frequencies of the diploid genotypes.

5. A study on blood types in a population found the following genotypic distribution among the people sampled: 1101 were MM, 1496 were MN and 503 were NN. Calculate the allele frequencies of M and N, the expected numbers of the three genotypic classes (assuming random mating). Determine whether or not this population is in Hardy-Weinberg equilibrium. Justify your answer.