**Biology III – New Quiz Study Guide**

**Mendelian Genetics**

From the reading*, “The Path of Reduction: Mendel’s Initial Steps,”* what are some of the criticisms of Mendelian Genetics? What are the factors/characteristics Mendel ignores in his experimentation?

Why do Mendel’s ideas not fit with the reality of the diversity of phenomena of plant life?

Explain some of the phenomena that don’t fit with Mendel’s basic picture of inheritance.

Codominance

Incomplete Dominance

Multiple Alleles

Pleiotrpy

Epistasis

Polygenetic Inheritance

What is a Punnet square and what can they be used for? Be able to complete Punnet Squares showing ***both single trait crosses and dihybrid crosses.*** Be able to interpret the ratios of phenotypes and genotypes in the offspring.

What is a chi-square test and why is it used? How are p-values interpreted?

**DNA Structure**

What did the experiments of Frederick Griffith indicate/prove?

What did Hershey and Chase’s experiments with bacteria and viruses show?

Explain Chargaff’s Rules. Be able to apply these rules to theoretical strands of DNA.

Example: what is the complimentary strand to ATTAGCCGTTAAG ?

What is a nucleotide? What are the three components?

Describe, chemically, the structure of DNA, including its antiparallel directionality and the bonding order of nucleotides.

What is supercoiling? What is its function? What protein is involved in this process and what is its function?

**DNA Replication**

Describe, in basic detail, the process of DNA replication. Specifically, know the following structural components of DNA undergoing replication: replication fork, leading strand, lagging strand, and Okazaki Fragments. As well, be able to explain the roles of the enzymes Helicase, Primase, DNA Polymerase III, and DNA Polymerase I.

Be able to explain the 5’🡪 3’ copying direction and why it is necessary.