1) Explain Protein synthesis in eukaryotic cells. Include the roles of RNA polymerase, splisosomes (snRNP’s), mRNA (codons), ribosomes, tRNA, amino acids.

2) If there is a single base substitution in the DNA, describe the possible outcomes on the completed polypeptide.

3) If there is a frameshift mutation, describe the effect on protein synthesis.

4) Name 2-3 environmental factors that increase the mutation rate in organisms. Discuss their effect on the genome (DNA).

5) Explain the how a single DNA base substitution causes sickle cell anemia. Discuss what type of mutation occurred and what effect this change had on the amino acid chain.

6) Explain, using a specific example (sickle cell, cystic fibrosis), the potential consequences of the production of a mutant protein to the structure and function of the cells in an organism.

7) How is the genetic material organized in prokaryotes vs. eukaryotes? Contrast transcription and translation in prokaryotes and eukaryotes.