Name _____ Date _____ Period _____

HONORS BIOLOGY – PROBLEM SET

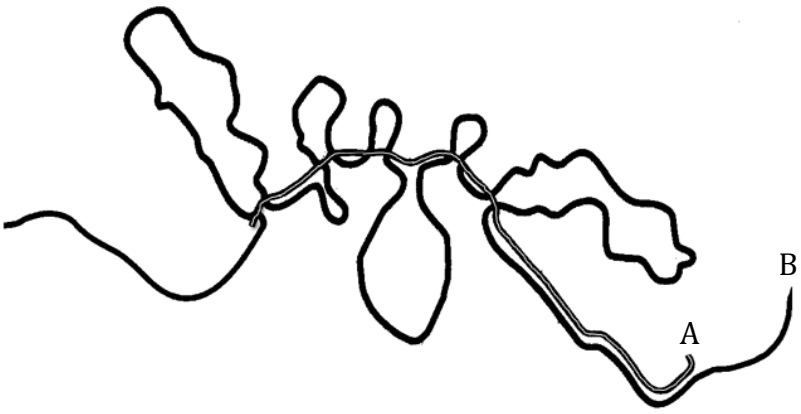
CHAPTER 10: MOLECULAR BIOLOGY OF THE GENE

1. A DNA sample has just been isolated. The scientist determined the following:

guanine content	22%
adenine content	28%
cytosine content	28%
thymine content	22%

Describe the error made by the scientist, and correct his findings. [2 points]

2. A scientist takes a small piece of DNA and its complementary mRNA and binds them together. Notice that some parts match (bind) and others do not. Some parts even form loop structures. [5 points]



a. Is "A" the DNA or the mRNA? How do you know?
b. Is "B" the DNA or the mRNA? How do you know?
c. On the mRNA, label the 5' cap and the 3' poly-A tail.
d. Label the parts of the DNA that would become INTRONS on the mRNA.
e. How can you tell the difference between the introns and exons?

3. Study the following DNA: `TGCATACTCGTTCGATCGAATTCGTAGC` [3 points]

a. What is the complementary mRNA sequence?
b. What is the primary structure of protein that is produced by the mRNA?
HINT: Pay attention to the start and stop codons!
c. Name all of the tRNA anti-codons that participate in building the protein.