DNA TRANSCRIPTION & TRANSLATION WORKSHEET.

1) Each DNA molecule has two sides, one is called the template from which the mRNA is constructed by RNA polymerase, and the other is the coding side which codes for a protein. If the template side of a DNA molecule is the sequence shown below, what will the coding side base sequence be? (Show the proper number of hydrogen bonds connecting the bases)

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coding
Template
T A C T T C C T A T T T C T T G T C A C C G C A C T
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2) If the template strand from above is used, what will the resulting mRNA molecule base sequence be? Write the base sequence for mRNA above the bases of the DNA molecule. Diagram a RNA nucleotide (197) in the box provided.

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mRNA
Template
T A C T T C C T A T T T C T T G T C A C C G C A C T
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3) Using the mRNA codon list (Page 207) for amino acids, determine the amino acid sequence for the mRNA sequence above.

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______  ______  ______  ______  ______  ______  ______  ______  ______
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4) If a mutation occurred to the fourth base in the template side, thymine, and a substitution occurred such that a guanine replaced the thymine, would the protein be changed? If so, how?
5) If the substitution occurred to the 6th base on the template side, such that the cytosine was changed to a thymine, would the protein change? Why?

6) Summarize the roles of the following enzymes that play a role in DNA functions?
   a. Helicase _________________________________________________________________
   b. DNA polymerase _________________________________________________________
   c. RNA polymerase _________________________________________________________

7) Describe the location of each process listed below and what then name the product of each process.
   a. Transcription __________________ ____________________________________________
   b. Translation __________________ ______________________________________________

8) Describe the role of the following base(s) on the DNA molecule.
   a. Codon _____________________________________________________________
   a. Promoter _____________________________________________________________
   b. Termination codon _____________________________________________________

9) List the start and stop codons found on RNA.
   a. Start codon ________________ b. Stop codons ___________ ___________ ___________ 

10) If the DNA coding strand is ATGTTAGTGCCAGTTGA, what would the amino acid sequence be?

11) If the above sequence was struck by radiation and the last “T” in “AGT” was changed to an “A”, how would the amino acid sequence be changed?

12) If the last base in the underlined sequence was changed by mutation to a “C”, how would the protein be changed?

13) If the 4th base in the sequence was deleted by radiation (mutation), how would the sequence be changed?