I. GENERAL
___1. What is it that makes Nucleic Acids Acidic?
   A. the amine bases.  
   B. the phosphate groups.  
   C. the sugars
   D. a carboxylic acid group  
   E. all of these.
___2. The geometry of the DNA molecule is
   A. a pleated sheet  
   B. an alpha-helix  
   C. a double helix
___3. What is the name for the three-base sequences on the mRNA?
   A. Anticodon  
   B. Codon  
   C. Exon  
   D. Interferon  
   E. Ribosome
___4. What is the name for the three-base sequences on the tRNA?
   A. Anticodon  
   B. Codon  
   C. Exon  
   D. Interferon  
   E. Ribosome

5. Draw the structures of the following nitrogen bases and the hydrogen bonds that connect them. 
   (Label δ+ and δ - atoms and use a dotted line (┉┉┉) to show hydrogen bonds.)
   Adenine (A) and Uracil (U)  
   Guanine (G) and Cytosine (C)  
   This pairing occurs in RNA or DNA? circle correct answer(s)
II. SIMULATION:
A. Replication of DNA:
1. List the base sequence in the second DNA strand formed from replication of the leading strand given.

New Daughter Strand of DNA (Non-template)

\[
\begin{array}{cccccccccccccccc}
3' & G & T & A & G & A & A & C & C & T & T & G & C & T & T & G & C \\
\end{array}
\]

Parent Strand of DNA (Template)

\[
\begin{array}{cccccccccccccccc}
5' & G & T & A & G & A & A & C & C & T & T & G & C & T & T & G & C \\
\end{array}
\]

B. Transcription of DNA to mRNA:
2. List the base sequences on the mRNA that would form from the DNA strand given:

New Strand of mRNA

\[
\begin{array}{cccccccccccccccc}
3' & G & T & A & G & A & A & C & C & T & T & G & C & T & T & G & C \\
\end{array}
\]

Parent Strand of DNA (Template Strand)

C. Translation of mRNA (Protein synthesis):
3. To the mRNA you made during transcription above complete and match the corresponding tRNAs. Use dotted lines to indicate H-bonds. Complete the structure for the side chains carried by each tRNA.

\[
\begin{array}{cccccccccccccccc}
\text{tRNAs} & | & \text{mRNA} \\
\end{array}
\]

4. A. Using the standard abbreviations for illustrating polypeptide structure (ie. Ala-glu-ser) write the polypeptide formed from the above sequence of mRNA.

B. Draw the completed peptide structure formed from the above sequence of mRNA.
5. A. If the following base sequence represents an original template strand of DNA what is polypeptide that would be formed? (show your work)

![Parent Strand of DNA (Template)](image)

B. Since there is more than one codon for many amino acids predict another base sequence of DNA that would result in the same polypeptide.