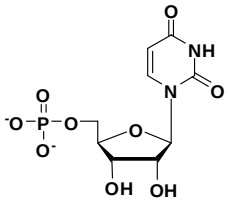
CHEM 203 Quam 2 Sample

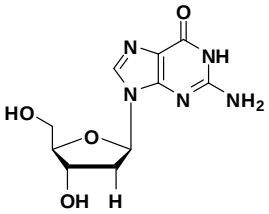
1. Which base is not found in DNA? _____ Which base is not found in RNA? _____

2. A complete turn of the DNA helix occurs at which distance?
   a) 20 Å b) 10 Å c) 34 Å d) 4 Å

3. The backbone of DNA is best described as:
   a. sugar glycosides
   b. pyrophosphates
   c. poly(1,3-diol-phosphate esters)
   d. pairs of complementary bases

4. Given the following structures, answer the following questions:





What is the name of the base? _____ _____

Which type of base is it?
(purine or pyrimidine?) _____ _____

Is this a nucleotide or nucleoside? _____ _____

Found in DNA, RNA or both? _____ _____

What is the name of the saccharide? _____

5. Which are types of RNA? (Sec. 20.4)
   I) histonal II) ribosomal III) transfer IV) helix

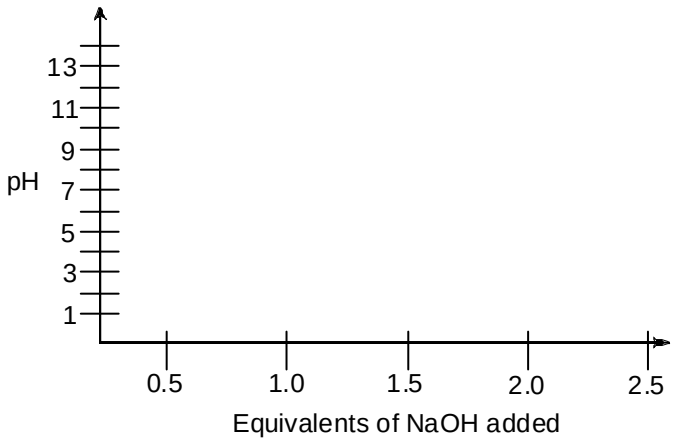
   a) I, II b) I, III c) II, III d) I, IV

6. Draw the proper form for naturally occurring alanine on the template:
   All naturally occurring amino acids are of the ____ stereochemical form.

7. For each class of amino acid indicated below give a representative example as a structure, name and abbreviation:
   a.) Non-polar side chain (not alanine or glycine) c.) Polar side chain

   b.) Acidic side chain d.) Basic side chain

8. Given the structure of isoleucine, a non-naturally occurring amino acid you prepared in lab, answer the following questions:
    a. What is the pK_A of the carboxylic acid part of an amino acid? _____ This is greater than or less than (circle one) the pK_A of a typical carboxylic acid: < or >
    b. What is the conjugate pK_A of the amino part of an amino acid? _____ This is greater than or less than (circle one) the conjugate pK_A of a typical amine: < or >
    c. The isoelectric point of a typical amino acid with no acidic/basic side chains is around _____
    d. At neutral pH a typical amino acid with no acidic/basic side chains exists as a neutral molecule containing one positive and one negative charge known as a _____
    e. On the graph provided, show the titration curve of isoleucine with NaOH; be sure to label where pH = pK_A and the isoelectric point.



9. In the space below give the structure for the dipeptide Gly-Ala. Label the *N*-terminus, *C*-terminus and peptide bond.

10. Primary (1^o) structure of a peptide is the _____ and _____ of amino acids in the chain

11. Given the results of the following tests, give the sequence of the pentapeptide

Amino acid analysis:	Ala, Arg, His, Phe, Ser
Edman Degradation:	Ala
Chymotripsin:	Fragment 1: His, Phe, Ala
	Fragment 2: Arg, Ser
Trypsin:	Fragment 1: Ala, Arg, His, Phe
	Fragment 2: Ser

_____ - _____ - _____ - _____ - _____
Final answer here

12. For each of the following types of secondary structure – give four key features and draw a simple line drawing of the structure:
    α-helix β-sheet

13. Tertiary structure is the overall arrangement of secondary structure in space. It is dominated by _____ (water loving) interactions and _____ (water loathing) interactions that orient different parts of the protein outward or inward respectively. _____ bonds between cysteine side chains serve to further cross-link and maintain the tertiary structure.