HOMEWORK #11

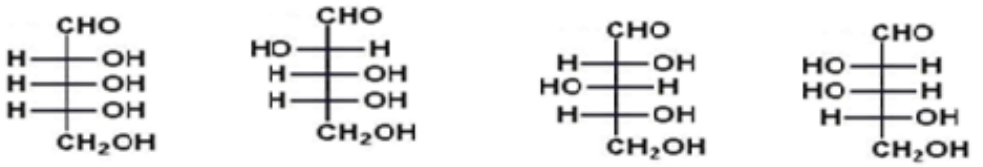
CHEM 121, section 1 Winter 2015 **Printed Name:** _____

Background for the Chapter. 22. Nucleic Acid

Homework Feb 27, 2015 by 12:15 PM! **Group Name:** _____

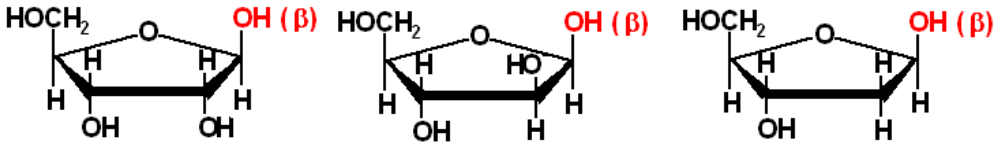
1) Give the names of names of pentose sugars written in Fisher projections (linear form) below.

Pentoses

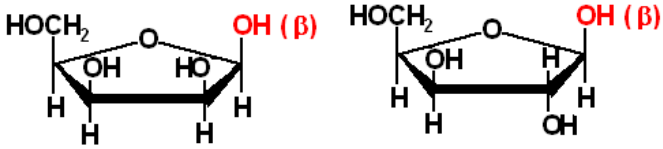


a) _____ b) _____ c) _____ d) _____

2) Give the names of names of pentose sugars written in Haworth projections (cyclic hemiacetal form) below. (Label the carbon atoms)

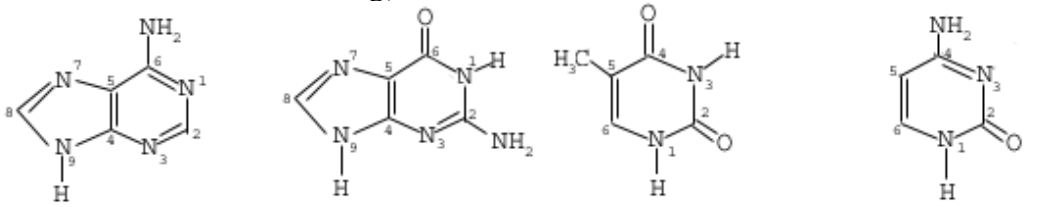


a) _____ b) _____ c) _____



d) _____ e) _____

3) Give the names of names of bases and identify them as purines and pyrimidines (Label the atoms in the ring)



a) _____ b) _____ c) _____ d) _____

4) a) What is phosphate and phosphate mono/di-esters?

b) What is a nucleotide?

b) Draw the structure of dAMP and GMP

5) Draw the following

a) Backbone of a nucleic acid

b) DNA sequence 5'-TGA CGG TAC CC-3'

6) What is the difference between DNA and RNA?

	DNA	**RNA**
number of strands		
sugar used		
bases used		
base pairs		
possible locations		
full name		

7) Write the type of RNA used for each of the following functions:

a) makes up part of the ribosome

b) delivers amino acid to the ribosomes

c) codes for proteins

8) Fill in the table:

	Name of process	**Location**
copying DNA		
making RNA from DNA		
making protein from RNA		

9) What is the name given to the short (610 bp) sequence of bases in the RNA prior to the start of transcription to which the RNA polymerase binds?

10)

(a) How many nucleotides make up a codon?

(b) How many different codons are there?

(c) How many different amino acids are there?

11. Write the RNA sequence transcribed from the following DNA sequence. **Then** write the amino acid sequence of the protein translated from that RNA.

5'-TGA TTT CGG TAC GAT TAA CAA CCT CGA ATT CC-3'

11. What causes the variation in traits that is the basis for evolution?

12. Why are frequently-dividing cells more prone to mutation?

13.

a) What is gene expression?

b) Why is gene expression regulated?

14. For each of the following mutations in the **DNA** sequence below, show then *explain* the effect that the mutation will have on the RNA **and** protein sequence and, if applicable, on the protein in general. (The numbers for each mutation below correspond to the arrows above the sequence.)

5'-TGA TTT CGG TAC GAT TAA CAA CCT CGA ATT CC-3'

a) T in GAT is replaced by C

b) T in TAA is replaced by C

c) first A in TAA is replaced by G

d) C in CAA is replaced by A