

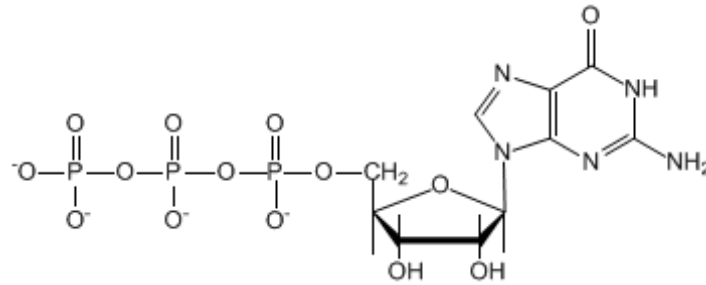
## Sample Questions for Midterm 1

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Which of the following were not available to Watson and Crick in the early 1950's to help them model the structure of the DNA double helix? 1) \_\_\_\_\_
- A) Chargaff's rule
  - B) NMR evidence that suggested hydrogen bonding between strands
  - C) the correct tautomeric forms (structures) of each nitrogenous base
  - D) X-ray fiber diffraction data that suggested the molecule was a helix
- 2) In pyrimidine nucleotide de novo biosynthesis, this molecule is combined with phosphoribosyl pyrophosphate to form the precursor molecule for UMP synthesis: 2) \_\_\_\_\_
- A) glutamine
  - B) borotate
  - C) urate
  - D) orotate
  - E) aspartate
- 3) A \_\_\_\_\_ consists of a nitrogenous base, ribose, and an inorganic phosphate group. 3) \_\_\_\_\_
- A) deoxynucleoside
  - B) nucleotide
  - C) nucleoside
  - D) nitroribophosphate
  - E) nucleotide phosphate
- 4) Which statement below best describes a property of negatively supercoiled circular DNA: 4) \_\_\_\_\_
- A) the two strands are squeezed together making it more difficult to separate strands
  - B) it is wrapped around a histone particle approximately 1.75 times.
  - C) negative supercoiling is introduced by topoisomerase I.
  - D) it has an overall right handed twist
  - E) because of the large unwinding forces, supercoiled DNA will kill the bacteria if it is cut or nicked
- 5) Thmidylate synthase catalyzes a reaction that has the following products: 5) \_\_\_\_\_
- A) this reaction can not be properly characterized by science at this time
  - B) dTTP and dihydrofolate
  - C) dTMP and dihydrofolate
  - D) dUMP and tetrahydrofolate
  - E) dUTP and dihydrofolate

6) The correct name for the following molecule is:

6) \_\_\_\_\_



- A) adenine-5'-triphosphate
- B) 2'-deoxyguanine-5'-triphosphate
- C) cytosine-3'-triphosphate
- D) adenosine-5'-triphosphate
- E) guanosine-5'-triphosphate

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

7) A-DNA is more narrow than B-DNA.

7) \_\_\_\_\_

8) During nick translation, only RNA is removed by DNA polymerase I.

8) \_\_\_\_\_

9) DNA polymerase III possesses 3' → 5' exonuclease activity.

9) \_\_\_\_\_

SHORT ANSWER. Write your answer in the space provided.

10) Draw the reactions involved in the oxidative branch of the pentose phosphate pathway. Include the structures of all intermediates, their names, enzymes involved, and any cofactors involved. PLEASE draw neatly.