Printed Name & SSN_____

MIC 226 FALL 97 DR BLINKOVA EXAM I

Answers. Answer the multiple choice questions on the answer sheet. Write answers to the other questions on the test. Turn in both answer sheet and test. Multiple choice, 2.5 pts each; others as indicated.

Read the questions carefully. For the multiple choice questions, choose only the best answer. Written answers which are correct in content but not relevant to the question cannot be scored correct.

Understanding the questions is part of the exam. Therefore, no questions about the exam will be answered, unless some of the exam questions are ambiguous, in which case, the entire class will be interrupted and the same explanation made to everyone. If you think that a question is ambiguous, inform the TA or instructor.

Several questions ask you to analyze lecture material and formulate an answer, rather than just to repeat material from memory.

1. Bacteria are classified into Divisions based on
   a. nature of the cell wall
   b. number of ribosomes
   c. size of the chromosome
   d. number of introns

2. Classes of biochemical compounds can be based on
   a. identity of functional groups in the compound
   b. their participation in anabolic or catabolic reactions
   c. the carbon:oxygen:hydrogen ratio
   d. the change in free energy associated with their reaction

3. Hydroxyl groups are related to alcohols as
   a. sulfhydryl groups are related to thiols
   b. hemiacetals are related to hemiketals
   c. aldehydes are related to ketones
   d. alcohols are related to esters

4. Carbonyl groups
   a. can be found only as terminal carbons
   b. can be found in sugars
   c. participate in forming anhydrides
   d. are high energy bonds

5. Esters
   a. are present in cytoplasmic membrane components
   b. yield a relatively low amount of free energy when broken
   c. are formed by the reaction of a acid with an alcohol
   d. all the above

6. Carbon atoms are always centers of asymmetry
   a. if they are found in amino acids
   b. if they have mirror images
   c. if they are covalently bonded to four different atoms or groups
   d. all the above

7. Examples of diastereoisomers (also called epimers) include
   a. D-glucose and L-glucose
   b. D-alanine and L-alanine
   c. D-glucose and D-galactose
   d. all non-identical mirror images

8. β-D-Glucose
   a. contains an ester
   b. is a hemiketal
   c. contains more than one hydroxyl group
   d. all the above

9. A solution of D-glucose in water
   a. has an acid pH
   b. could react with an acid to form an anhydride
   c. contains some α-D-glucose
   d. contains a ketone

10. Monosaccharides
    a. include ribose
    b. must contain at least two hydroxyl groups
    c. are incorporated into peptidoglycan
    d. all the above

11. Phospholipids
    a. are the storage material for energy
    b. are electrically charged because the phosphate portion dissociates into a proton and an anion
    c. contain high energy anhydride bonds
    d. yield a lot of energy when the phosphate is split from the glycerol

12. Amino acids
    a. usually contain an asymmetric carbon
    b. are polymerized to form peptides in peptidoglycan
    c. are found in cytoplasmic membrane components
    d. all the above

13. Flagellin is a protein. It
    a. is a polymer of amino acids
    b. is much higher in molecular weight than individual amino acids
    c. contains peptide bonds
    d. all the above

14. Bacterial chromosomes
    a. are double stranded DNA
    b. generally are present in two copies per cell, meaning that bacteria typically are diploid
    c. commonly have introns
    d. all the above

15. Bacteria must be provided food which
    a. includes all the amino acids required for protein synthesis
    b. serves as a source of carbon for biosynthesis reactions
    c. has a positive change in free energy when it is used
    d. is reduced to yield energy

16. Chemical reactions are characterized by a change in free energy. Free energy
    a. is excess heat generated by a reaction
    b. is related to the speed of a reaction
    c. is that which can be used to do work
    d. is reduced by enzymes which catalyze reactions

17. Exergonic reactions
    a. do not require activation energy
    b. will occur spontaneously
    c. require ATP
    d. have a positive change in free energy

18. Enzyme catalyzed reactions
    a. have a lower change in free energy than those which are not catalyzed
    b. require less activation energy than those which are not catalyzed
    c. can be endergonic, but not exergonic
    d. depend on oxidation and reduction of the enzyme

19. Enzymes
    a. emerge unchanged from the reactions which they catalyze
    b. are synthesized in a series of catabolic reactions
    c. shift the equilibrium between the amount of products formed and amount of the reactants
    d. all the above

20. In the bacterial cytoplasm, you expect to find
    a. enzymes involved in active transport of food
    b. proteins which sense the presence of food in the environment
    c. ribosomes
    d. peptidoglycan synthesizing enzymes