Printed Name _____

MIC 226 FALL 97 DR BLINKOVA EXAM 2 MULTIPLE CHOICE

1. Fermentation by microorganisms could produce which final product(s)?
   a. pyruvate
   b. ribose
   c. carbon dioxide
   d. all the above

2. Fermentation involves
   a. oxidation/reduction reactions
   b. production of energized membrane
   c. terminal electron acceptors
   d. all the above

3. All organisms which use respiration to generate energy
   a. get more energy per molecule of glucose than do organisms which use fermenation
   b. require oxygen to accept electrons from the food being oxidized
   c. require the enzyme ATP synthase to pump electrons outside the cytoplasmic membrane
   d. have enzymes which balance oxidation and reduction reactions internally so that terminal electron acceptors are not necessary

4. The last step (or series of reactions) required to generate proton motive force is
   a. formation of a pH gradient across the cytoplasmic membrane
   b. the rotation of flagella to energize the cytoplasmic membrane
   c. reaction of ADP plus inorganic phosphate plus protons to form ATP
   d. oxidation/reduction reactions involving the coenzyme $NAD^+/NADH + H^+$

5. To distinguish autotrophic from heterotrophic organisms, you would say that
   a. autotrophs can live in a more reducing environment than can heterotrophs
   b. autotrophs can live in an inorganic environment, whereas heterotrophs cannot.
   c. autotrophs do not require terminal electron acceptors, whereas heterotrophs do.
   d. autotrophs oxidize glucose whereas heterotrophs catabolize glucose

6. The final number of bacterial cells growing exponentially in liquid medium after a certain time will depend on
   a. the initial number of cells
   b. the amount of time incubated
   c. the generation time
   d. all the above

7. The concept of selective toxicity was first successful in treating
   a. tuberculosis
   b. syphilis
   c. salvarsan
   d. *Staphylococcus aureus* infections

8. The sulfonamides are effective chemotherapeutic agents because
   a. they are structural analogs of an essential bacterial compound
   b. they are not present in eukaryotic organisms.
   c. they are antibiotics
   d. they are inhibiting prokaryotic, but not eukaryotic, protein synthesis

9. The mechanism of penicillin action is
   a. inhibition of protein synthesis
   b. inhibition of chromosome supercoiling
   c. inhibition of crosslinking of peptidoglycan sidechains
   d. it is a structural analog of folic acid

10 Streptomycin is selectively toxic because it
   a. inhibits protein synthesis on eukaryotic ribosomes
   b. is produced by a living organism
   c. is a synthetic drug
   d. all the above

11. The reactions which are inhibited in prokaryotes by penicillin are
    a. transaminations
    b. transpeptidations
    c. transglycosylations
    d. nucleotidyl transfers

12. If you know that the sequence of nucleotides within one strand of a fragment of DNA is 5' AATCGC 3', you can deduce that the sequence of the second strand will be
    a. 5' TTAGCG 3'
    b. 5' AATCGC 3'
    c. 5' GCGATT 3'
    d. 5' CGCTAA 3'

13. What is meant by the statement that the two strands of DNA are anti-parallel?
    a. The two strands are wound around each other.
    b. The chromosome is supercoiled.
    c. The two strands are oriented 5' to 3' in opposite directions.
    d. The nucleic acid bases stick out from the sugar - phosphate - sugar - phosphate backbone.

14. The two strands of DNA are said to be complementary because
    a. The nucleic acid bases are hydrogen bonded in pairs of A : T and G : C only.
    b. The two strands can be unwound only action of helicases.
    c. Topoisomerases maintain supercoiling.
    d. All the above.

15. Nucleotidyl transfer reactions
    a. Join adjacent 5' hydroxyl groups to 3' phosphate groups
    b. yield pyrophosphate as a product
    c. have the same mechanism as transpeptidation reactions
    d. transfer double stranded DNA to single strand form

16. A characteristic which is unique to leading strand DNA synthesis and not characteristic of lagging strand synthesis is:
    a. It is continuous
    b. It is catalyzed
    c. It occurs in the 5' to 3' direction, overall
    d. all the above

17. The enzyme DNA polymerase III
    a. unwinds double stranded DNA
    b. catalyzes joining of adjacent Okazake pieces
    c. catalyzes nucleotidyl transfer
    d. all the above

18. It is characteristic of DNA polymerization that
    a. ribonucleoside triphosphates are substrates
    b. the process is conservative
    c. 5' phosphates are joined to existing 3' hydroxyls
    d. all the above

19. Transpeptidation reactions
    a. are involved in forming glycosidic bonds
    b. crosslink peptidoglycan side chains
    c. are inhibited by folic acid analogs
    d. require nucleoside triphosphates

20. Pumping protons outside the cytoplasmic membrane
    a. depends on enzymes
    b. energizes the membrane for motility
    c. generates proton motive force
    d. all the above