Take-Home Quiz II

General Instructions and Information: Obtain an answer sheet from the instructor and legibly write your name in the appropriate space. After placing your name, you must enter your Patron ID Number (NOT your social security number) in the appropriate space and darken the corresponding bubbled numbers. Be sure to place the number zero ("0") in the first two squares, and then follow it with the six digits of your patron ID number. Leave the last square blank. Be absolutely certain to darken the appropriate bubbles. Should you not enter your patron ID number or should you incorrectly darken the bubbles, five (5.0) points will be deducted from your final score for this quiz. In addition, be sure to place the instructor’s last name on the lines provided. This Take-Home Quiz consists of fifty (50) questions. Fifteen are multiple-choice questions, whereas the remaining thirty five consist of True/False statements. When answered correctly, each is worth one point (1) point. Please note that your answer sheet is due NO LATER than 11:00 AM, Wednesday, June 15th. Answer sheets returned later than this deadline will not be accepted and a score of “0” will be recorded.

Note the following restrictions: You are permitted to collaborate on this quiz with other students who are currently enrolled in this course. However, you are not permitted to just copy answers from one another. You must make an honest effort to actively gather the answers by yourself or within a study group. The lack of a good faith effort on your part will be considered academic dishonesty. Also, receiving help from students not enrolled in this course or from sources other than those specifically associated with this course will be considered an act of academic dishonesty. Such incidents will not be tolerated and will be handled according to course and University policy.

Instructions For Answering Multiple Choice Questions: Read each question very carefully. Determine the BEST answer for a particular question from among the four different choices listed below it. Darken the appropriate bubble on the answer sheet corresponding to the question you are answering. In doing so, be sure to follow the instructions on the back of the answer sheet. Mismarked answer sheets (i.e, answers placed out of order) will not be rescored. Hence, you are strongly encouraged to review your answer sheet before returning it.

1. The net gain of ATP per molecule of glucose metabolized anaerobically via the Embden-Meyerhoff pathway in procaryotes is
   A) 2.
   B) 36.
   C) 38.
   D) 85.
2. Production of ATP using the energy liberated by the electron transport system is generally referred to as __________.
   A) chemiosmotic  
   B) respiration  
   C) substrate-level  
   D) conformational change

3. In higher eucaryotes, most aerobically generated ATP is produced by
   A) glycolysis.  
   B) the TCA cycle.  
   C) a membrane bound proton translocating ATP synthase.  
   D) all of these generate equal amounts of ATP.

4. In the TCA cycle, two carbons in the form of __________ are added to oxaloacetate at the start of the cycle.
   A) acetyl-CoA  
   B) ethanol  
   C) carbon dioxide  
   D) methanol

5. Which of the following can be used as electron acceptors during anaerobic respiration?
   A) nitrate  
   B) sulfate  
   C) carbon dioxide  
   D) all of the above

6. Mitochondrial electron transport takes place
   A) on the outer mitochondrial membrane.  
   B) on the inner mitochondrial membrane.  
   C) in the fluid matrix of the mitochondria.  
   D) a and b

7. In metabolic channeling, the regulation of metabolic pathways is controlled by the __________ of metabolites and enzymes involved in the pathway.
   A) amount  
   B) location  
   C) activity  
   D) all of the above

8. Enzymes catalyze a reaction by
   A) decreasing the amount of energy released by the reaction.  
   B) increasing the amount of energy released by the reaction.  
   C) decreasing the activation energy of the reaction.  
   D) increasing the activation energy of the reaction.
9. A small molecule binds to an Allosteric enzyme and thereby increases the activity of the enzyme. What is the small molecule called?
   A) Negative effector
   B) Positive effector
   C) Cofactor
   D) Prosthetic group

10. Which will require a longer time to kill?
    A) a larger population of microorganisms
    B) a smaller population of microorganisms
    C) Killing will be equally as rapid in a large or a small microbial population.
    D) There is no way to predict which will require a longer kill time.

11. Moist heat sterilizes by
    A) causing the formation of thymine dimmers.
    B) denaturing proteins.
    C) causing production of singlet oxygen.
    D) all of the above

12. The disinfectant action of phenol and phenolic derivatives mainly is due to
    A) its inherent detergent action.
    B) membrane damage and protein denaturation.
    C) oxidation of disulfide bonds in proteins.
    D) extraction of lipids from membranes.
    E) damage to nucleic acids and proteins caused by free radicals.

13. Which of these methods can be used to determine the number of viable microorganisms in a sample?
    A) light scattering in a spectrophotometer
    B) measuring total cell mass
    C) measuring colony forming units per ml
    D) counting a known volume of cells in a hemocytometer

14. Organisms that ignore oxygen and grow equally well in its presence or absence are called
    A) facultative anaerobes.
    B) microaerophiles.
    C) aerotolerant.
    D) anoxygenic.

15. Most microorganisms maintain their internal pH
    A) near neutral (pH 7).
    B) near their optimum growth pH.
    C) slightly acidic (pH 4-6).
    D) slightly alkaline (pH 8-10).
Instructions For Answering True/False Questions: Read each of the following True/False questions very carefully. Determine if the statement that you are reading, as written, is true or false. If you believe that the statement is true, then darken the “A” bubble on the answer sheet corresponding to the numbered statement you are answering. If you believe that the statement is false, then darken the “B” bubble on the answer sheet corresponding to the numbered statement you are answering. Mismarked answer sheets (i.e., answers placed out of order) will not be rescored. Hence, you are strongly encouraged to review your answer sheet before returning it.

16. When a young, vigorously growing culture of bacteria is transferred to fresh medium of the same composition, the lag phase is usually short or absent.

17. Obligate anaerobes are usually poisoned by molecular oxygen but may grow in aerobic habitats if associated with facultative anaerobes that use up all available oxygen.

18. During the lag phase of microbial growth, the cells are metabolically inactive.

19. Membranes of some thermophilic Archaea are stabilized by lipids that span the membrane and form a rigid stable tetraether based monolayer.

20. Ultraviolet radiation is generally more harmful than ionizing radiation.

21. DNA of thermophiles is stabilized by binding of special histone proteins.

22. Membranes of some thermophilic bacteria are stabilized by ether linked phospholipids.

23. Heavy metals may denature proteins by reacting with their sulfhydryl groups.

24. Ultraviolet radiation is an effective means of sterilizing surfaces.

25. Alcohols are widely used as antiseptics and disinfectants because they are effective against endospores as well as vegetative cells.

26. Because filtration removes rather than destroys microorganisms, it does not truly sterilize the materials passing through the filter.

27. Dry heat methods usually require lower temperatures and shorter exposure times than moist heat methods to achieve the same degree of killing because of the drying effects of this form of heat.

28. Heavy metals are effective antimicrobial agents but are not widely used because of their high toxicity to humans.
29. Quaternary ammonium compounds can be used as skin antiseptics because of their low toxicity.

30. Germicides kill all pathogenic organisms and endospores.

31. Freezing at low temperature stops or greatly slows microbial growth due to DNA strand breakage.

32. Enzymes increase the rate of a reaction by increasing molecular motion, thereby providing kinetic energy to drive the reaction.

33. Enzymes increase the rate of a reaction but do not alter equilibrium constants.

34. Enzyme activity can be greatly affected by the pH and the temperature of the environment in which the enzyme must function.

35. Each enzyme normally has specific pH and temperature optima at which they function best.

36. A reaction will occur spontaneously if the free energy of the system increases during the reaction.

37. Although most autotrophic microorganisms fix carbon dioxide using the Calvin-Benson cycle, this pathway is absent in the Archaea.

38. The use of compartmentation for the simultaneous but independent regulation of anabolic and catabolic pathways occurs generally in eucaryotes but not in procaryotes.

39. The biosynthesis of some amino acids require the use of some TCA cycle intermediates as carbon skeletons.

40. One of the ways in which cells independently regulate anabolic and catabolic pathways is by the use of different cofactors for similar reactions.

41. Fermentation involves the use of pyruvate and/or other organic molecules as electron acceptors.

42. Autotrophs are the only organisms that can incorporate (fix) carbon dioxide into biomolecules.

43. All eucaryotic photosynthesizers are oxygenic.

44. Metabolic pathways can be either catabolic or anabolic but not both.
45. The electron transport systems in eucaryotes and procaryotes use different electron carriers.

46. Although most metabolic reactions are freely reversible, a few irreversible catabolic steps are bypassed during biosynthesis with special enzymes that catalyze the reverse reaction in order to allow for independent regulation of catabolic and anabolic pathways.

47. An organism may use glycolysis and the pentose phosphate pathway simultaneously.

48. In the process of fermentation an organic substrate, such as glucose, is reduced and an intermediate of the pathway, such as pyruvate, is oxidized.

49. All eucaryotic organisms use the same terminal oxidase for the electron transport system, whereas procaryotes use several different terminal oxidases.

50. Oxygen is always required for the regeneration of NAD from NADH.