Introduction to Microbiology
BIOL 220
Summer Session I, 1996
Exam # 1

Name _____

I. Multiple Choice (1 point each)

__B___1. Which is possessed by eukaryotes but not by prokaryotes?
A. Cell wall
B. Distinct nucleus surrounded by a membrane
C. Membrane separating inside of cell from the environment
D. Protein-synthesizing machinery

__B___2. Which organism is not a eukaryote?
A. Fungus
B. Bacterium
C. Algae
D. Protozoan

__D___3. All of the following are common to both eukaryotes and prokaryotes except:
A. Plasma membrane
B. One or more chromosomes
C. Ribosomes
D. Mitochondria

__A___4. Which type of pathogen might be most difficult to treat with antibiotics?
A. Virus
B. Bacteria
C. Fungus
D. Protozoan

__D___5. Which of the following represents the correct way to name a microbe?
A. *Genus Species*
B. *genus species*
C. *genus Species*
D. *Genus species*

__D___6. DNA from an unknown organism is mixed with DNA from four known organisms. The percent hybridization is 45% with organism 1, 78% with organism 2, 81% with organism 3, and 89% with organism 4. The unknown organism is most closely related to:
A. Organism 1 C. Organism 3

B. Organism 2 D. Organism 4

__C___7. An organism is found to be a gram-positive, endospore-forming rod. To what genus does it possibly belong?

A. Escherichia C. Bacillus
B. Streptococcus D. Mycobacterium

__D___8. What two events make retroviruses different from other viruses?

A. Making RNA from protein and DNA from RNA
B. Making RNA from protein and inserting RNA into host chromosome
C. Making DNA from RNA and making proteins from DNA
D. Making DNA from RNA and inserting DNA into host chromosome

__A___9. Which of the following is not true of the viral genome?

A. It can contain both RNA and DNA
B. It can be either linear or circular
C. It can be double- or single-stranded
D. It can be in one or many segments

__C___10. All of the following is true of lysogeny except..

A. The viral chromosome does not replicate
B. The viral chromosome is usually attached to the host chromosome
C. The host cell dies
D. New viruses are not produced

II. Fill-In (1 point each) Spell out the terms as completely as possible!!!

11-13. The cell wall of bacteria is composed of three units. These are **_N-acetyl muramic__**, **__N-acetyle glucosamine**_____, and ____**tetra-peptide**_____.

14. The cell wall of bacteria is called ____**peptidoglycan** _____.

15. Gram negative cells have an external membrane called ___**lipopolysaccharide** _____.

16. The protein shell of a virus is called the **__capsid**_____.

17. A virus that infects a bacteria is called a ____**bacteriophage**_____.

18. The virus infection in which the viral nucleic acid integrates into the host cell DNA and viral replication stays dormant for a period of time is called the **__lysogenic**_____ stage.

19. An RNA virus goes through a DNA stage is called a ___**retrovirus**_____.

20. A bacteria that has a capsule is (genus name) ____***Klebsiella***_____.

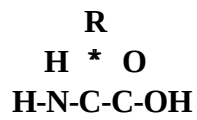
21. A bacteria that is a Gram + coccus and grows in chains is (genus name) __***Streptococcus***____.
22. A bacteria that is acid-fast is (genus name) ___***Mycobacteria***_____.

23. A bacterial growth media that acts as a differential media is __**blood**_____ agar.

24. An example of a selective agar that allows for the growth of only a few types of bacterial species is ___**salt containing**_____.

25. Proteins are composed of ___**amino acids**_____.

26. Draw the typical structure of a protein subunit:



27. A pH indicator used in some broths and agars is ____**phenol red**____ _____.

28-29. A typical lipid molecule is composed of a hydrophilic region that contains a __**glycerol**_____ molecule to a hydrophobic region which contains 3 __**fatty**_____ __**acid**_____ molecules.

30. A typical 5 carbon sugar is ___**ribose (deoxyribose**)___.

31. A typical six carbon sugar is ___**glucose**_____.

32-33. The DNA pyrimidine bases are ___**thymidine**_____ and ___**cytosine**_____.

34-35. In RNA the __**thymidine**_____ base is replaced by ____**uracil**_____.

36. The process of making RNA from DNA is called ___**transcription**_____.

37. The process of making proteins from RNA is called ____**translation**_____.

38. Bacteria that like to grow in high salt concentrations are called ____**halophiles**_____.

39. The manual that helps to classify bacterial species is called _____**Bergey's**_____ ___**Manual of Descriptive Bacteriology**____.

40. Retroviruses contain the enzyme ____**reverse transcriptase**_____.

41-44. List Koch's Postulates:

a. Disease organisms must be found in all cases

b. Organisms must be grown in pure culture

c. Organisms must be inoculated into model system to produce disease

d. Organisms must be reisolated from diseased animals

45-50. List the stages of viral infection:

a. Adsorption (attachment)

b. Penetration

c. Uncoating

d. Synthesis

e. Assembly

f. Release

51-52. *Neisseria* is a Gram __-___ (+ or -) bacteria that has a ____**coccus**_____ shape.

III. TRUE-FALSE (1 point each)

__**F**___53. The envelope that surrounds a virus is made by the virus and is viral specific.

__**F**___54. The bacterial external membrane of Gram - bacteria is considered to be an exotoxin.

__**F**___55. The theory that life arises from non-living material is called the theory of biogenesis.

__**T**___56. The ribosomes of bacterial are composed of two subunits that have a 70S size compared to the larger eukaryotic ribosome that is 80S.

__**T**___57. Prokaryotic organisms do not have the capability of photosynthesizing.

__**F**___58. Prokaryotic organisms lack mitochondria and do not have the capability of producing energy.

__**T**___59. Virus' lack mitochondria and do not have the capability of producing energy.

__**T**___60. Cell receptors are composed of protein.

__**T**___61. Bacterial cells have a doubling rate of 20 minutes.

__**F**___62. The mordant in the Gram Stain is safranin.

__**T**___63. Spores are formed only when the environmental conditions are poor for growth.

__**F**___64. Positive stranded (+) RNA viruses must carry a pre-formed enzyme that will allow them to make an RNA appropriate for binding to the ribosome.

__**F**___65. An infectious agent composed of only protein material is called a viroid.

LIST 5 characteristics that can be used for the identification of bacterial strains:

66.

67.

68.

69.

70.

BONUS: Draw a typical bacterial cell wall structure (3 points)