

Micr-22 Exam 1, Spring 2013, C. Briggs (scaled to 100pts)

Name: _____

Tip: Answer the questions you know first. At least guess on everything before you turn this in.

Vocabulary: Briefly define these terms in the space provided, as though you were speaking to someone who never took this class. (3pts each)

1. Normal microbiota:

2. Inclusion (the structure):

3. Phage typing:

4. Competitive exclusion:

Short Answers: Words, drawings, charts – all are welcome.

5. Please write a properly-formatted species name. 2pts

6. Why do we use scientific names rather than common names to describe organisms? 1pt

7. Which groups of microbes are prokaryotes? Which are eukaryotes? 2pts

Archaea

Bacteria

Protozoa

Fungi

Helminths / worms

Algae

Viruses

8. What is the first letter of your last name? _____ Based on this letter, describe the contributions the following person made to microbiology: 2pts A-H = Leeuwenhoek I-P = Pasteur Q-Z = Koch

9. People once believed all microbial diseases would be controlled by the twenty-first century. Name one emerging infectious disease. List three reasons why we are identifying new diseases now. 2pts

10. What physical property of electron microscopes allows them to produce images with greater resolution than light microscopes? 1pt

11. One of your colleagues is examining a slide under a light microscope, and he is frustrated because he cannot clearly see the edges and interiors of the bacteria. What type of light microscopy would you suggest he use instead of the normal brightfield? 1pt

12. Maude the microbiologist would like to see the detailed surface of flagella on living bacterial cells. Why are both light microscopes and electron microscopes insufficient for this project? 2pts

13. Why are drugs that target cell wall synthesis safe for us to ingest? 1pt

14. If you were a mad-scientist bacterium, and you wanted to make a chemical that would destroy all eukaryotic life forms (but harm no bacteria), what potential cell structures could you target? 1pt

15. Modified multiple choice; 2pts.

Possible responses:

- (A) Gram-negative bacterial cell wall
- (B) Gram-positive bacterial cell wall
- (C) both A and B
- (D) none of the above

Answer:

- Contains embedded proteins _____
- Contains a thin layer of peptidoglycan _____
- Contains cellulose _____
- Contains a phospholipid bilayer _____

16. Please draw the following cell arrangements: 3pts

staphylococcus

diplobacillus

streptovibrio (Leonardo Maggi saw it in 1885.)

17. Under what conditions do endospores form, and why are they valuable to bacteria? 2pts

18. A co-worker is complaining of dizziness and nausea. His skin feels dry and hot. He has been eating salty snacks all day. Using what you know about osmosis, explain briefly why ingesting salt could lead to dehydration. 1pt

19. List four features of chloroplasts and mitochondria that suggest their endosymbiotic origin. 2pts

20. What are the three (currently-accepted) domains of living things? 1pt

21. Maude changes her project and instead wants to distinguish among bacteria based on their DNA. Besides PCR, list three methods she can use to pursue her classifications. 3pts

22. Koch's postulates say that (1) the same pathogen must be present in every case of the disease, and (2) the pathogen must be isolated in pure culture.

a. What is step 3? 1pt

b. What do results of step 3 tell us? 1pt

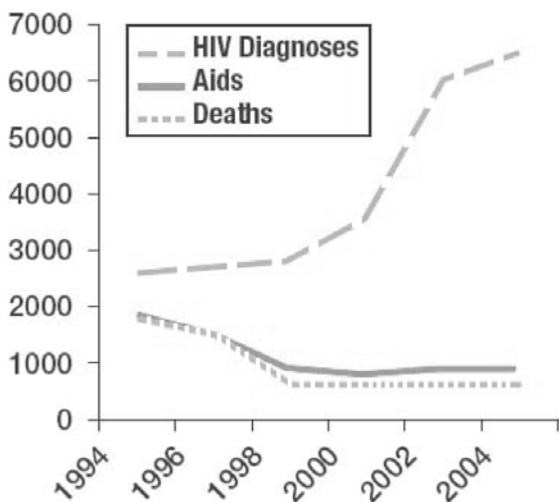
23. *Yersinia pestis* causes plague (a zoonosis) when it is transmitted to people from rodents via a tick bite. 3pts

a. What is the vector in this example?

b. What is the reservoir in this example?

c. Name another common vector of other zoonoses.

24. The following data represent HIV-positive diagnoses, AIDS diagnoses, and AIDS deaths in the UK. Explain what the graph shows is happening, in terms of HIV infections, AIDS, and the interconnections. Suggest a reason for the changes seen. 2pts



25. On a walk during high school (true story), my friend told me she liked the fresh scent in the air. She suspected that maintenance workers used a lemon-scented soap on the sidewalks. I thought the eucalyptus trees above us were producing the smell. Thinking scientifically, what observations would definitively settle our disagreement? 2pts