

MICROBIOLOGY – EBIO practice exam 2

Circle the letter of the right answer.

1. A phylogenetic system of classifying organisms is also called a natural system and should be based on
 - a. evolutionary relationships among organisms
 - b. structural and morphological similarities among organisms
 - c. the biases and preconceptions of individual scientists
 - d. the idea that large organisms should be studied more intensively than small ones
2. Which of the following are strict aerobes?
 - a. *Streptomyces*
 - b. *methanogens*
 - c. *Pseudomonas*
 - d. *Escherichia*
 - e. a and c
3. Which of the following bacteria are commonly found in both human intestines **and** yogurt?
 - a. *Bifidobacterium* and *Actinomyces*
 - b. *Escherichia coli* and *Lactobacillus acidophilus*
 - c. *Lactobacillus acidophilus* and *Bifidobacterium bifidus*
 - d. *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus thermophilus*
4. Which of the following are predatory bacteria in the Delta Proteobacteria that produce complex (macroscopic) fruiting bodies?
 - a. *Caulobacter*
 - b. *Bdellovibrio*
 - c. Myxobacteria
 - d. *Beggiatoa*
 - e. all of the above
5. Which pair is most closely related in a phylogenetic sense?
 - a. Animals and Archaea
 - b. Fungi and Animals
 - c. Bacteria and Archaea
 - d. Proteobacteria and Crenarchaeota
6. Members of the genus *Pseudomonas* have _____ flagella and are Gram _____.
 - a. peritrichous / negative
 - b. polar / negative
 - c. peritrichous / positive
 - d. polar / positive
7. Glucose ----> 1 lactic acid + 1 ethanol + 1 CO₂, is how
 - a. acetic acid bacteria make a living.
 - b. heterolactic fermenters make a living.
 - c. *Propionbacterium* makes a living.
 - d. homolactic fermenters make a living.
 - e. *Beggiatoa* makes a living
8. Methanogens play an important role in the world because they are
 - a. the only organisms that can breakdown methane.
 - b. usually the terminal step in anaerobic food webs that lead to the decomposition of organic matter.
 - c. the dominant organism in animal guts and can cause several diseases.
 - d. the major cause of stinky flatulence.

9. Draw the "Tree of Life" (**label the 3 main branches**) and place the following groups of organisms on it: (12 pts.)

Lactobacillus, Mitochondria, Crenarchaeota, *Chlamydia*, Planctomyces, Euryarchaeota, Proteobacteria, Methanogens, High and low GC Gram + Bacteria, *Corynebacterium*, *Bdellovibrio*.

27. Fill in the blanks from the following list (the list goes from largest or broadest taxonomic group (top of list) to the most narrow (bottom of list)). (8 pts.)

Proteobacteria, *typhimurium*, Bacteria, Fungi, Archaea, Eucarya, Enterobacteriaceae, *Salmonella*

| | |
|-----------------|---------------------|
| Domain | Bacteria |
| Phylum/Division | _____ |
| Class | Gammaproteobacteria |
| Order | Enterobacteriales |
| Family | _____ |
| Genus | _____ |
| Species | _____ |

30. Explain why there is a succession from *Streptococcus thermophilus* to *Lactobacillus delbruekii* during the yogurt making process (4 pts.) (50 words or less)

31. Briefly explain the endosymbiotic origins of mitochondria and chloroplasts (50 words or less) (4 pts.)

32. Briefly describe how thermophilic Archaea can live at such high temperatures – specifically how they stabilize either their proteins, DNA or membrane lipids (50 words or less). (4 pts.)