

SELF-TESTS

In the matching section, there is only one answer to each question; however, the lettered options (a, b, c, etc.) may be used more than once or not at all.

I. Matching

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| ___ 1. Adapted to high salt concentrations, which are required for growth. | a. Buffer |
| ___ 2. The general term used for organisms capable of growth at 0°C. | b. Mesophile |
| ___ 3. Capable of growth at high temperatures; optimum 50° to 60°C. | c. Thermophile |
| ___ 4. Used in media to neutralize acids. | d. Psychrophile |
| ___ 5. A phenomenon that occurs when bacteria are placed in high salt concentration. | e. Psychrotroph |
| ___ 6. Term used in text for organisms that grow well at refrigerator temperatures; optimum growth is at temperatures of 20–30°C. | f. Plasmolysis |
| ___ 7. Microbes that grow better at high CO ₂ concentrations. | g. Extreme halophile |
| ___ 8. Members of the archaea with an optimum growth temperature of 80°C or higher. | h. Facultative halophile |
| ___ 9. Considered a synonym for psychrotroph by some microbiologists. | i. Hyperthermophile |
| | j. Capnophile |
| | k. Facultative psychrophile |

II. Matching

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| ___ 1. An enzyme acting upon hydrogen peroxide. | a. Nitrogen fixation |
| ___ 2. <i>Rhizobium</i> bacteria do this in symbiosis with leguminous plants. | b. Obligate aerobe |
| ___ 3. Requires atmospheric oxygen to grow. | c. Obligate anaerobe |
| ___ 4. Requires atmospheric oxygen, but in lower than normal concentrations. | d. Aerotolerant anaerobe |
| ___ 5. Does not use oxygen, but grows readily in its presence. | e. Catalase |
| ___ 6. Does not use oxygen and usually finds it toxic. | f. Microaerophile |
| ___ 7. Important source of energy, carbon, nitrogen, and sulfur requirements in complex media. | g. Peptones |
| | h. Agar |

III. Matching

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| ___ 1. Breaks down hydrogen peroxide without generation of oxygen. | a. Hydroxyl radical |
| ___ 2. Formed in cytoplasm by ionizing radiation. | b. Peroxidase |
| ___ 3. An enzyme that converts hydrogen peroxide into oxygen and water. | c. Superoxide dismutase |
| ___ 4. The toxic form of oxygen neutralized by superoxide dismutase. | d. Superoxide free radicals |
| ___ 5. A component added to some culture media that makes the Petri plate into a self-contained anaerobic chamber. | e. Singlet oxygen |
| | f. Catalase |
| | g. Oxyrase |

IV. Matching

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| ___ 1. Isolation method for getting pure cultures; uses an inoculating loop to trace a pattern of inoculum on a solid medium. | a. Pour plate |
| ___ 2. A device for maintaining bacteria in a logarithmic growth phase. | b. Streak plate |
| ___ 3. Used to increase the numbers of a small minority of microorganisms in a mixed culture to arrive at a detectable level of microorganisms. | c. Spread plate |
| ___ 4. Preservation method that uses quick-freezing and a high vacuum. | d. Differential medium |
| ___ 5. Accumulations of microbes large enough to see without a microscope. | e. Reducing medium |
| ___ 6. Microbes added to initiate growth. | f. Enrichment culture |
| | g. Lyophilization |
| | h. Deep-freezing |
| | i. Chemostat |
| | j. Inoculum |
| | k. Colonies |

V. Matching

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| ___ 1. New cell numbers balanced by death of cells. | a. Log phase |
| ___ 2. No cell division, but intense metabolic activity. | b. Lag phase |
| ___ 3. A logarithmic plot of the population produces an ascending straight line. | c. Death phase |
| | d. Stationary phase |

VI. Matching

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| ___ 1. Used to grow obligate anaerobes. | a. Selective media |
| ___ 2. Designed to suppress the growth of unwanted bacteria and to encourage growth of desired microbes. | b. Differential media |
| ___ 3. Generally contain ingredients such as sodium thioglycolate that chemically combine with dissolved oxygen. | c. Complex media |
| ___ 4. Nutrients are digests or extracts; exact chemical composition varies slightly from batch to batch. | d. Reducing media |
| | e. Chemically defined media |

Fill in the Blanks

1. Agar is a _____ derived from a marine alga.
2. A few bacteria and the photosynthesizing _____ are able to use gaseous nitrogen directly from the atmosphere.
3. _____ are the most common microbes; their optimum temperatures are 25° to 40°C.
4. Osmotic effects are roughly related to the _____ of molecules in a given volume of solution.
5. A complex medium in liquid form is called nutrient _____.
6. For preservation by _____, a pure culture of microbes is placed in a suspending liquid and quick-frozen at -50° to -95°C.
7. Bacteria usually reproduce by _____ fission.
8. Turbidity is recorded in a spectrophotometer as _____.
9. The growth of filamentous organisms such as fungi is often best recorded by means of _____.
10. _____ anaerobes grow more efficiently aerobically than they do anaerobically.
11. _____ halophiles do not require high salt concentrations, but they are able to grow at salt concentrations that may inhibit the growth of many other bacteria.
12. Examples of buffers are _____ salts; peptones and _____ found in complex media are also buffers.
13. Any nutrient material prepared for the growth of bacteria in a laboratory is called a _____.
14. Agar melts at about the boiling point of water but remains liquid until the temperature drops to about _____.
15. Dilutions of a bacterial mixture are poured into a Petri dish and mixed with melted agar. This plate-counting method is called the _____.
16. Partially digested protein products used in complex media are called _____.
17. In order to grow obligate intracellular parasites such as rickettsias and chlamydias, it is usually necessary to provide _____.
18. The general term for tests that estimate microbial growth by the time required for them to deplete oxygen in the medium is _____ tests.

19. The _____ growth temperature is that at which the organism grows best.
20. When a single colony arises from a clump of bacteria, it is recorded as a _____.

Critical Thinking

1. What conditions that are characteristics of the food tend to retard spoilage in each of the following foods?
 - a. Grape jelly
 - b. Pickles
 - c. Salted fish
 - d. Cheddar cheese
2. What kinds of microorganisms (molds, lactic acid bacteria, endospore-forming bacteria, aerobic bacteria, etc.) would be most likely to cause spoilage of each of the foods listed above? (*Hint: See Chapter 28.*)
3. Plate counts are the most common method used to enumerate microbial populations. Discuss the advantages or disadvantages of the use of plate counts for:
 - a. Milk intended for commercial sale
 - b. Molds
4. Draw a bacterial growth curve indicating the four phases of growth. At which phase of growth would exposure to antibiotics cause the most adverse effects on the bacterial population? Why?