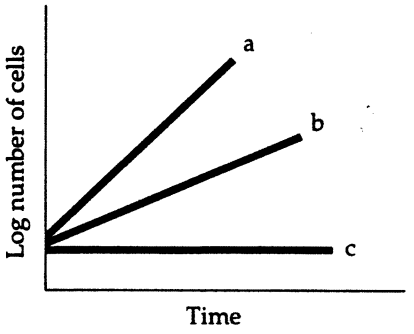
Chapter 6 Test

Objective Questions

Understanding

Use this graph to answer questions 1 and 2.



b

1. Which line best depicts a facultative anaerobe in the absence of O_2?

b

2. Which line best illustrates a mesophile at 5°C above its optimum temperature?

a
Recall

3. The addition of which of the following to a culture medium will neutralize acids?
   a. Buffers
   b. Sugars
   c. pH
   d. Heat
   e. Carbon

d
Analysis

4. Salts and sugars work to preserve foods by creating a
   a. Depletion of nutrients.
   b. Hypotonic environment.
   c. Lower osmotic pressure.
   d. Hypertonic environment.
   e. Lower pH.

c
Analysis

5. The term facultative anaerobe refers to an organism that
   a. Doesn't use oxygen but tolerates it.
   b. Is killed by oxygen.
   c. Uses oxygen or grows without oxygen.
   d. Requires less oxygen than is present in air.
   e. Prefers to grow without oxygen.

c
Recall

6. Which of the following is *not* a disadvantage of the standard plate count?
   a. Cells may form aggregates.
   b. Requires incubation time.
   c. Determines viable cells.
   d. Chemical and physical requirements are determined by media and incubation.
   e. None of the above.

d
Recall

7. Which of the following is *not* a disadvantage of the direct microscopic count?
   a. Some organisms are motile.
   b. Enumerates dead cells.
   c. No incubation time.
   d. Sample volume is unknown.
   e. Large number of cells is required.

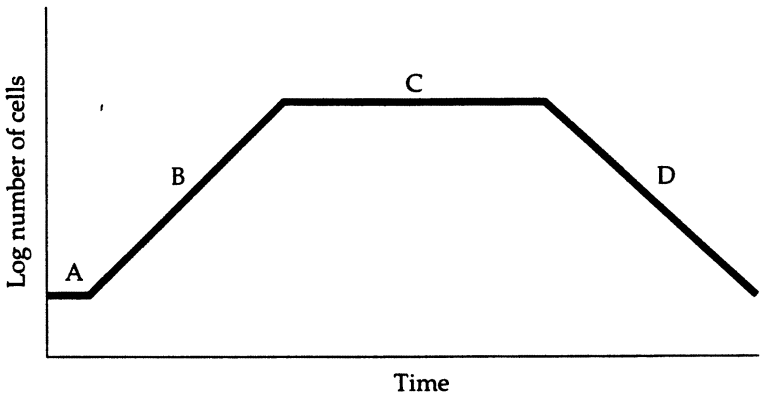
e
Understanding

8. Which of the following is *not* used to determine metabolic activity?
   a. Acid production from fermentation.
   b. CO_2 produced from the Krebs cycle.
   c. NO_2^- produced from the electron transport chain.
   d. Decreased dissolved oxygen.
   e. Turbidity.

d
Understanding

9. Thirty-six colonies grew in nutrient agar from 1.0 ml of undiluted sample in a standard plate count. How many cells were in the original sample?
   a. 4
   b. 9
   c. 18
   d. 36
   e. 72

Use this typical bacterial growth curve to answer questions 10 and 11.



c
Recall

10. Which section shows a growth phase where the number of cells dying equals the number of cells dividing?
    a. A
    b. B
    c. C
    d. D
    e. A and C

b
Analysis

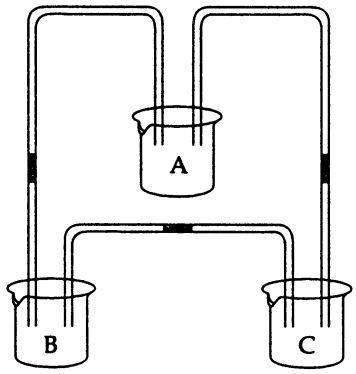
11. Which sections of the graph illustrate a logarithmic change in cell numbers?
    a. A and C
    b. B and D
    c. A and B
    d. C and D
    e. B only

c
Recall

12. Most bacteria grow best at pH
    a. 1.
    b. 5.
    c. 7.
    d. 9.
    e. 14.

b
Understanding

13. This diagram shows three containers of water connected by tubes. A selectively permeable membrane divides each tube. Solutes are added to each container to give final concentrations of 5% NaCl in A; 10% NaCl in B; and 5% sucrose in C.



When the experiment is first set up, the initial movement of water will be
    a. A to B; B to C; C to A.
    b. A to B; C to B; C to A.
    c. A to C; B to C; C to A.
    d. A to C; C to B; C to A.
    e. B to A; B to C; C to A.

d
Analysis

14. A culture medium on which only gram-positive organisms grow and a yellow halo surrounds *Staphylococcus aureus* colonies is called a(n)
    a. Selective medium.
    b. Differential medium.
    c. Enrichment culture.
    d. a and b.
    e. b and c.

b
Analysis

15. A culture medium consisting of agar, human blood, and beef heart is a
    a. Chemically defined medium.
    b. Complex medium.
    c. Selective medium.
    d. Differential medium.
    e. Reducing medium.

b
Recall

16. Which of the following pairs is mismatched?
    a. Psychrotroph—growth at 0°C
    b. Thermophile—growth at 37°C
    c. Mesophile—growth at 25°C
    d. Psychrophile—growth at 15°C
    e. None of the above

b
Understanding

17. During which growth phase will gram-positive bacteria be most susceptible to penicillin?
    a. Lag phase
    b. Log phase
    c. Death phase
    d. Stationary phase
    e. The culture is equally susceptible during all phases.

b
Recall

18. Which of the following is the best definition of generation time?
    a. The length of time it takes for lag phase.
    b. The length of time it takes for a cell to divide.
    c. The minimum rate of doubling.
    d. The duration of log phase.
    e. The time it takes for nuclear division.

d
Analysis

19. All of the following are direct methods to measure microbial growth *except*
    a. Direct microscopic count.
    b. Standard plate count.
    c. Filtration.
    d. Metabolic activity.
    e. MPN.

b
Recall

20. Which group of microorganisms is most likely to spoil a freshwater trout preserved with salt?
    a. Psychrophiles
    b. Halophiles
    c. Anaerobes
    d. Thermophiles
    e. None of the above

b
Analysis

21. Which of the following is an organic growth factor?
    a. Glucose
    b. NAD^+
    c. Peptone
    d. $NH_4H_2PO_4$
    e. All of the above

b
Understanding

22. Which of the following is an example of a metabolic activity that could be used to measure microbial growth?
    a. Standard plate count
    b. Glucose consumption
    c. Direct microscopic count
    d. Turbidity
    e. MPN

d
Analysis

23. An experiment began with 4 cells and ended with 128 cells. How many generations did the cells go through?
    a. 64
    b. 32
    c. 6
    d. 5
    e. 4

a
Analysis

24. Three cells with generation times of 30 minutes are inoculated into a culture medium. How many cells are there after 5 hours?
    a. 3×2^{10}
    b. 1024
    c. 243
    d. 48
    e. 16

Understanding

Use these choices to answer questions 25 and 26: Choices may be used once, more than once, or not at all.
    a. Aerobe
    b. Aerotolerant anaerobe
    c. Obligate anaerobe

a

25. This organism produces catalase and superoxide dismutase.

c

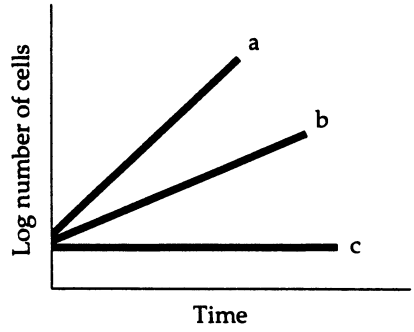
26. This organism is killed by atmospheric O_2.

b
Recall

27. Producers in the hydrothermal vents on the ocean floor use CO_2 for their carbon source and what for energy?
    a. Light
    b. Sulfide
    c. Organic molecules
    d. Carbon dioxide
    e. None of the above

Understanding

Use this graph to answer questions 28 through 32.



c

28. Which line depicts the growth of an anaerobe in the presence of O_2?

b

29. Which line depicts the growth of a mesophile with an optimum temperature of 35°C incubated at 40°C?

c

30. Which line shows the growth of an obligate aerobe incubated anaerobically?

a

31. Which line best illustrates the growth of a facultative anaerobe incubated aerobically?

c

32. Which line best depicts a catalase-negative cell incubated aerobically?

Analysis

Below are three different culture media. Use them to answer questions 33 and 34.

Medium A	*Medium B*	*Medium C*
Na_2HPO_4	Tide® detergent	Glucose
KH_2PO_4	Na_2HPO_4	Peptone
$MgSO_4$	KH_2PO_4	$(NH_4)_2SO_4$
$CaCl_2$	$MgSO_4$	KH_2PO_2
$NaHCO_3$	$(NH_4)_2SO_4$	Na_2HPO_4

a

33. Which medium (media) is (are) chemically defined?
    a. A
    b. B
    c. A and B
    d. A and C
    e. None of the above

a

34. On which medium would an autotroph grow?
    a. A
    b. B
    c. A and B
    d. A and C
    e. None of the above

b
Analysis

35. Which of the following should *not* be included in a medium used to select for a nitrogen-fixing chemoheterotroph?
    a. KH_2PO_4
    b. $(NH_4)_2SO_4$
    c. Glucose
    d. $MgSO_4$
    e. Na_2HPO_4

c
Understanding

36. Assume you inoculated 100 cells into 100 ml nutrient broth. You then inoculated 100 cells of the same species into 200 ml nutrient broth. After incubation for 24 hr, you should have
    a. More cells in the 100 ml.
    b. More cells in the 200 ml.
    c. The same number of cells in both.

c
Analysis

37. The source of nutrients in nutrient agar is
    a. Agar.
    b. Nutrient.
    c. Peptone and beef extract.
    d. Peptone and NaCl.
    e. All of the above.

Recall

Use the following choices to answer questions 38 through 40. Choices may be used once, more than once, or not at all.

a. Catalase
b. Oxidase
c. Peroxidase
d. Superoxide dismutase
e. None of the above

d

38. Catalyzes the reaction: $O_2^- \cdot + O_2^- \cdot + 2H^+ \rightarrow H_2O_2 + O_2$

a

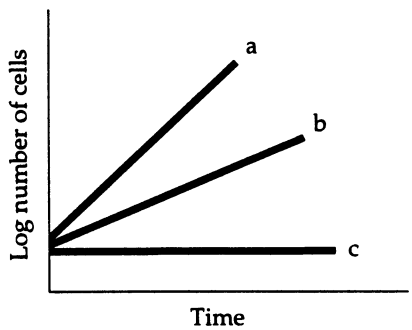
39. Catalyzes the reaction: $2H_2O_2 \rightarrow 2H_2O + O_2$

c

40. Catalyzes the reaction: $H_2O_2 + 2H^+ \rightarrow 2H_2O$

Understanding

Use this graph to answer questions 41 through 44.



b

41. Micrococci are facultative halophiles. Which line best depicts the growth of *M. luteus* in a nutrient medium containing 7.5% NaCl?

c

42. Which line best depicts a psychrophile incubated at room temperature?

b

43. Which line best depicts a psychrotroph incubated at 0°C?

a

44. Which line best depicts *Neisseria gonorrhoeae* when growing inside the human body?

c
Analysis

45. The following data show growth of two bacteria on different media.

	Amount of growth	
	Staphylococcus aureus	*Streptococcus pyogenes*
Nutrient agar	++	++
Nutrient agar + 7.5% NaCl	+	–

These data indicate that *S. aureus* is a(n)

a. Mesophile.
b. Facultative anaerobe.
c. Facultative halophile.
d. Aerobe.
e. Halophile.