

MULTIPLE CHOICE - Choose the one alternative that best completes the statement or answers the question.

18) You apply the acid-fast stain method to a patient's specimen, an aspirate from the lungs. Microscopic examination reveals a large number of bright pink-red bacillus-shaped bacteria in the smear. Which statement is true?

- 18) _____.
- A) This is the expected outcome for normal sputum.
 - B) The patient has pneumonia.
 - C) The patient has tuberculosis.
 - D) The patient has an HIV infection.

30) Serological analysis for bacterial identification typically involves using _____.

- 30) _____
- A) specific antibodies to the bacterial cell antigens
 - B) methods to identify cell enzymes
 - C) the analysis of the appearance of colonies
 - D) a microscope to determine cell

morphology
E) the determination of guanine + cytosine base concentrations

36) Which of the following is not a phenotypic trait of bacteria?

- 36) _____
- A) rRNA sequence
 - B) Cell shape
 - C) Nutrient requirements
 - D) Biochemical reactions

39) The function of bacterial endospores is _____.

39. _____
- A) reproduction and growth
 - B) protection of genetic material during harsh conditions
 - C) storage of excess cellular building blocks
 - D) to provide a protected site for photosynthesis

40) Chemical analysis of a bacterial cell detects dipicolinic acid. What is the identity of this structure?

- 40) _____
- A) Cell wall
 - B) Capsule
 - C) Biofilm
 - D) Nucleoid
 - E) Endospore

41) Endospores are _____.

41) _____

- A) metabolically inactive
- B) resistant to heat and chemical treatments
- C) resistant to destruction by radiation
- D) living structures
- E) All of the choices are correct.

42) Bacterial endospores are produced by _____.

42) _____

- A) *Staphylococcus*
- B) *Entamoeba*
- C) *Bacillus*
- D) *Mycoplasma*

43) All of the following occur during endospore germination except _____.

43) _____

- A) dehydration of the cell components
- B) binding of a small organic molecule to initiate germination
- C) enzymes digest the endospore cortex
- D) the cell grows out of its protein coats

44) All of the following structures contribute to the ability of pathogenic bacteria to cause disease except _____.

44) _____

- A) inclusions
- B) fimbriae
- C) capsule
- D) slime layer
- E) gram-negative outer membrane

46) Plasmids _____.

46) _____

- A) are found in all bacteria
- B) are essential for survival
- C) cannot be passed between organisms
- D) are located in microcompartments
- E) often carry genes controlling pathogenicity

47) All bacterial cells have _____.

47) _____

- A) a chromosome
- B) an S-layer
- C) the ability to produce endospores
- D) capsules
- E) flagella

48) Which of the following bacterial structures is incorrectly matched with a function?

48) _____

- A) Ribosomes - protein synthesis
- B) Inclusions - excess cell nutrients and materials
- C) Plasmids - contain genes essential for growth and metabolism
- D) Nucleoid - hereditary material
- E) Cytoplasm - dense, gelatinous solution

49) The site for ATP synthesis in bacterial cells is the _____.

49) _____

- A) ribosome
- B) mitochondrion
- C) cell wall
- D) cell membrane
- E) microcompartment

50) The most immediate result of destruction of a cell's ribosomes would be that _____.

50) _____

- A) material would not cross the cell membrane
- B) protein synthesis would stop
- C) the chromosome would unravel
- D) glycogen inclusions would form
- E) holes would appear in the capsule

51) The chromosome in bacteria and archaea _____.

51) _____

- A) is located in the cell membrane
- B) contains all the cell's plasmids
- C) is part of the nucleoid
- D) forms a single linear strand of DNA

53) A bacterial genus that has waxy mycolic acid in the cell walls is _____.

53) _____

- A) *Mycobacterium*
- B) *Mycoplasma*
- C) *Streptococcus*
- D) *Corynebacterium*.
- E) *Bacillus*

54) *Mycobacterium* and *Nocardia* are different from most gram-positive bacteria in that their cell walls _____.

54) _____

- A) contain more peptidoglycan
- B) contain unique, waxy lipids
- C) are easily decolorized during staining
- D) contain a layer of lipopolysaccharide

56) Lipopolysaccharide is an important cell envelope component of _____.

56) _____

- A) gram-negative bacteria
- B) gram-positive bacteria
- C) acid-fast bacteria
- D) mycoplasmas
- E) protoplasts

58) Peptidoglycan is a unique macromolecule found in bacterial _____.

58) _____

- A) cell walls
- B) cell membranes
- C) capsules
- D) slime layers
- E) inclusions

59) A bacterial cell wall that has primarily peptidoglycan with small amounts of teichoic acid and lipoteichoic acid is _____.

59) _____

- A) gram-negative
- B) gram-positive
- C) a protoplast
- D) a spheroplast
- E) acid-fast

60) The macromolecule containing alternating *N*-acetylglucosamine (NAG) and *N*-acetylmuramic acid (NAM) chains cross-linked by short peptide fragments is _____.

60) _____

- A) mycolic acid
- B) lipopolysaccharide
- C) peptidoglycan
- D) lysozyme
- E) teichoic acid

61) Gram-negative bacteria _____.

61) _____

- A) are generally more susceptible to antibiotics than gram-positive bacteria
- B) have a more complex cell envelope with a greater variation in chemical composition
- C) appear purple following the Gram stain
- D) include all pathogens

62) If bacteria living in salty seawater were displaced to a freshwater environment, the cell structure that would prevent the cells from rupturing is the _____.

62) _____

- A) endospore
- B) cell wall
- C) cell membrane
- D) capsule
- E) slime layer

63) The outcome of the Gram stain is based on differences in the _____.

63) _____

- A) ribosomes
- B) cell wall
- C) cell membrane
- D) flagella

64) Which is the correct order for the application of reagents in the Gram stain?

***. 64) _____

- A) Crystal violet, safranin, iodine, alcohol/acetone
- B) Crystal violet, alcohol/acetone, iodine, safranin
- C) Crystal violet, iodine, alcohol/acetone, safranin
- D) Iodine, safranin, crystal violet, alcohol/acetone
- E) Safranin, crystal violet, alcohol/acetone, iodine

65) The cell membrane, the cell wall, and the outer membrane comprise the _____.

65) _____

- A) glycocalyx
- B) cell envelope
- C) peptidoglycan
- D) slime layer
- E) S-layer

66) During the Gram stain, the application of alcohol results in the decolorization of _____ cells.

66) _____

- A) gram-positive
- B) gram-negative
- C) all
- D) pleomorphic

67) *Mycobacterium* and *Nocardia* are distinguished from other bacteria by the _____ stain.

67) _____

- A) acid-fast
- B) methylene blue
- C) endospore
- D) Gram
- E) basic

68) The chemical bonds in peptidoglycan can be hydrolyzed by the enzyme _____, found in tears and saliva.

68) _____

- A) penicillinase
- B) lysozyme
- C) peptidase
- D) kinase

69) Lysozyme is most effective against _____.

69) _____

- A) gram-negative organisms
- B) gram-positive organisms
- C) mycoplasmas
- D) cyanobacteria
- E) archaea

70) Chemotaxis refers to the ability of a cell to _____.

70) _____

- A) move in response to light
- B) move in response to a chemical
- C) halt movement in response to a chemical
- D) transport desired molecules into a cell

72) A bacterial cell exhibiting chemotaxis must have _____.

72) _____

- A) fimbriae
- B) a capsule
- C) thylakoids
- D) flagella
- E) metachromatic granules

73) Which external structure protects bacteria from phagocytosis?

73) _____

- A) Slime layer
- B) Fimbriae
- C) Cell membrane
- D) Capsule

74) Two structures that allow bacteria to adhere to surfaces are _____ and _____.

74) _____

- A) pili; ribosomes
- B) fimbriae; capsules
- C) lipopolysaccharide; teichoic acid
- D) actin filaments; phospholipid membranes
- E) endospores; metachromatic granules

75) Spirochetes are able to move due to _____.

75) _____

- A) a periplasmic flagellum
- B) a membrane-bound flagellum
- C) cilia serving as walking feet
- D) pseudopods
- E) glycocalyx for gliding motility

76) Two functions of bacterial appendages are _____ and _____.

76) _____

- A) attachment; motility
- B) motility; energy production
- C) antibiotic resistance; motility
- D) attachment; energy production

78) The term that refers to the presence of flagella all over the cell surface is _____.

78) _____

- A) amphitrichous
- B) atrichous
- C) lophotrichous
- D) monotrichous
- E) peritrichous

79) The term that refers to the presence of a tuft of flagella emerging from a single site is _____.

79) _____

- A) amphitrichous
- B) atrichous
- C) lophotrichous
- D) monotrichous
- E) peritrichous

80) The term that refers to flagella at both poles of the cell is _____.

80) _____

- A) amphitrichous
- B) atrichous
- C) lophotrichous
- D) monotrichous
- E) peritrichous

81) The bacterial flagellum has three components. In order from the cytoplasm to the external environment, they are _____.

81) _____

- A) filament, hook, and basal body
- B) filament, basal body, and hook
- C) basal body, hook, and filament
- D) hook, basal body, and filament
- E) basal body, filament, and hook

82) The short, numerous appendages used by some bacterial cells for adhering to surfaces are called _____.

82) _____

- A) flagella
- B) cilia
- C) fimbriae
- D) periplasmic flagella (axial filaments)
- E) pili

83) The transfer of genes during bacterial conjugation involves rigid, tubular appendages called _____.

83) _____

- A) flagella
- B) cilia
- C) fimbriae
- D) periplasmic flagella (axial filaments)
- E) sex pili

84) When bacilli in a chain fold back upon each other like a hinge, this cellular arrangement is termed a _____.

84) _____

- A) tetrad
- B) strep
- C) staph
- D) sarcina
- E) palisade

85) An irregular cluster of spherical bacterial cells is termed ____.

85) _____

- A) streptobacillus
- B) staphylobacillus
- C) staphylococcus
- D) streptococcus
- E) staphylospirillum

86) A chain of rod-shaped cells would be called a _____.

- 86) _____
- A) streptobacillus
 - B) *Staphylobacillus*
 - C) streptococcus
 - D) staphylococcus
 - E) palisade
- 87)** Which term is not used to describe bacterial cell shape?

- 87) _____
- A) Coccus
 - B) Tetrad
 - C) Vibrio
 - D) Bacillus
 - E) Spirochete

- 88)** Bacterial cells could have any of the following appendages except _____.

- 88) _____
- A) flagella
 - B) cilia
 - C) fimbriae
 - D) periplasmic flagella (axial filaments)
 - E) pili

- 89)** Which of the following is not a characteristic of bacteria?

- 89) _____
- A) DNA is free in the cytoplasm.
 - B) The cell wall is made of peptidoglycan or other distinct polysaccharides.
 - C) Ribosomes are present as the site of protein synthesis.
 - D) Organelles termed mitochondria are the site of ATP production.

- 91)** Alcohol-based hand sanitizers specifically target lipids, making them most effective when trying to eliminate _____.

- 91) _____
- A) gram-negatives
 - B) gram-positives
 - C) endospores
 - D) viruses
 - E) biofilms

- 92)** Which of the following properties are shared by both bacteria and archaea?

- 92) _____
- A) Method of DNA compaction
 - B) Single, circular chromosome
 - C) Ester linkages in fatty acids
 - D) Cell wall polysaccharides

18) C

29) D

30) A

36) A

39) B

40) E

41) E

42) C

43) A

44) A

46) E

47) A

48) C

49) D

Answer Key

PreTest - Chapter 4

50) B

67) A

51) C

68) B

53) A

69) B

54) B

70) B

56) A

72) D

58) A

73) D

59) B

74) B

60) C

75) A

61) B

76) A

62) B

78) E

63) B

79) C

64) C

80) A

65) B

81) C

66) B

82) C

83) E

84) E

85) C

86) A

87) B

88) B

89) D

91) A

92) B