

Registration form

**WET LAB PROCEDURES \$200.00
48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL \$50.00**

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You will have 90 days from this date in order to complete this course

List number of hours worked on assignment must match State Requirement. _____

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Your certificate will be mailed to you in about two weeks.

Please circle/check which certification you are applying the course CEU's.

Water Treatment ___ Water Distribution ___ Other _____

Lab Analyst ___ Wastewater Treatment _____

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State Approval Listing Link, check to see if your State accepts or has pre-approved this course. Not all States are listed. Not all courses are listed. Do not solely trust our list for it may be outdated. It is your sole responsibility to ensure this course is accepted for credit.

Professional Engineers; Most states will accept our courses for credit but we do not officially list the States or Agencies. Please check your State for approval.

You can obtain a printed version of the course manual from TLC for an additional \$69.95 plus shipping charges.

AFFIDAVIT OF EXAM COMPLETION

I affirm that I personally completed the entire text of the course. I also affirm that I completed the exam without assistance from any outside source. I understand that it is my responsibility to file or maintain my certificate of completion as required by the state or by the designation organization.

Grading Information

In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

For security purposes, please fax or e-mail a copy of your driver's license and always call us to confirm we've received your assignment and to confirm your identity.

Some States and many employers require the final exam to be proctored.

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Wet Lab Answer Key

Name _____

Phone _____

You are solely responsible in ensuring that this course is accepted for credit by your State. No refunds. Did you check with your State agency to ensure this course is accepted for credit?

**Method of Course acceptance confirmation. Please fill this section
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Did you receive the approval number if Applicable? _____

What is the approval number if Applicable? _____

Please use Adobe Acrobat DC or Pen to complete this answer Key

Please Circle, Bold, Underline or X, one answer per question.

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This course contains general EPA's SDWA federal rule requirements. Please be aware that each state implements water / sampling procedures/safety/ environmental / building regulations that may be more stringent than EPA's regulations. Check with your state environmental/health agency for more information. These rules change frequently and are often difficult to interpret and follow. Be careful to not be in non-compliance and do not follow this course for proper compliance.

Please fax the answer key to TLC Western Campus Fax (928) 272-0747
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Always call us after faxing the paperwork to ensure that we've received it.

Please e-mail or fax this survey along with your final exam

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Wet Lab Procedures CEU Training Course Assignment

The Assignment (Exam) is also available in Word on the Internet for your Convenience, please visit www.ABCTLC.com and download the assignment and e-mail it back to TLC.

You'll have 90 days from the start of this course to complete in order to receive your Professional Development Hours (**PDHs**) or Continuing Education Unit (**CEU**). A score of 70 % is necessary to pass this course. We prefer if this exam is proctored. No intentional trick questions. If you should need any assistance, please email all concerns and the completed manual to info@tlch2o.com.

We would prefer that you utilize the enclosed answer sheet in the front, but if you are unable to do so, type out your own answer key. Please include your name and address on your manual and make copy for yourself.

1. Most pathogens are generally associated with diseases that _____ and affect people in a relatively short amount of time, generally a few days to two weeks.
- | | |
|---------------------------------|----------------------------------|
| A. Limits the treatment process | D. Will cause fatalities |
| B. Are mild in nature | E. Limit the travel of pathogens |
| C. Cause intestinal illness | F. None of the Above |

How Diseases Are Transmitted.

2. Waterborne pathogens are primarily spread by the?
- | | |
|---|-----------------------|
| A. Fecal-oral, or feces-to-mouth, route | D. Influenza route |
| B. Dermal to fecal route | E. Waterborne mishaps |
| C. Oral to fecal route | F. None of the Above |
3. When infecte humans or animals pass the bacteria, viruses, and _____ in their stool, pathogens may get into water and spread disease.
- | | |
|------------------------------|----------------------|
| A. Fecal Coliform and E coli | D. Cryptosporidiosis |
| B. Protozoa | E. Bioslime |
| C. Macroorganisms | F. None of the Above |
4. For another person to become infected, he or she must take that pathogen in through the mouth.
- A. True B. False
5. This term means when in nature it is different from other types of pathogens such as the viruses that cause influenza (the flu) or the bacteria that cause tuberculosis.
- | | |
|------------------------------|---------------------------|
| A. Fecal Coliform and E coli | D. Waterborne Pathogen(s) |
| B. Giardia lamblia | E. Coliform bacteria |
| C. Microorganism(s) | F. None of the Above |
6. According to the text, these are spread by secretions that are coughed or sneezed into the air by an infected person.
- | | |
|------------------------------|--|
| A. Fecal Coliform and E coli | D. Influenza virus and tuberculosis bacteria |
| B. Giardia lamblia | E. Coliform bacteria |
| C. Microorganisms | F. None of the Above |

Chain of Transmission

7. The pathogens must survive in the water, that will depend on the temperature of the water and the length of time the _____ are in the water.
- A. Stomach bugs D. Germs
B. Turbidity E. Pathogens
C. Microscopic particles F. None of the Above
8. Which pathogen may survive for months such as Giardia or?
- A. Illness D. Campylobacteriosis
B. Cryptosporidium E. Tamylobacteriosis
C. Bacteria F. None of the Above
9. This chain lists the events that must occur for the transmission of disease via drinking water. By breaking the chain at any point, the Transmission of disease will be prevented.
- A. True B. False
10. Water must have feces and must contain this term to cause a waterborne disease.
- A. Campylobacteriosis D. Fecal-oral material
B. Pathogens E. Contaminated water
C. Waterborne illness(es) F. None of the Above

Viral-Caused Diseases

11. Which of the following terms is an example of a common viral disease that may be transmitted through water?
- A. Pathogen D. Campylobacteriosis
B. Yersiniosis E. Incubation period
C. Hepatitis A F. None of the Above
12. The onset is usually abrupt with fever, malaise, loss of appetite, nausea and abdominal discomfort, followed within a few days by jaundice.
- A. True B. False
13. Which of the following terms in drinking water can be inactivated by chlorine or other disinfectants?
- A. Illnesses D. Pathogen(s)
B. Giardiasis E. Infections
C. Viruses F. None of the Above

The Main Players- History and Biology Chapter 1

Circumstances under which Koch's postulates do not easily apply

14. According to the text, which of the following terms may develop only when an opportunistic pathogen invades a susceptible host?
- A. Disease(s) D. Divide
B. Mutation(s) E. Reproduction
C. Carriers F. None of the Above
15. Which of the following terms are caused by dietary deficiencies?
- A. Disease(s) D. Pathogen(s)
B. Mutation(s) E. Microorganisms
C. Carriers F. None of the Above

16. According to the text, which of the following terms are very difficult to grow under in-vitro (in the laboratory) conditions?

- A. Disease(s)
- B. Mutation(s)
- C. Carriers
- D. Pathogen(s)
- E. Microbes
- F. None of the Above

17. Fastidious organisms can now be grown in cultures of human or animal cells or in small animals.

- A. True
- B. False

18. Not all laboratory animals are susceptible to all?

- A. Pathogens
- B. Secondary invaders
- C. Microorganisms
- D. Disease
- E. Chemical reactions
- F. None of the Above

19. Some of the diseases are inherited or are caused by abnormality in chromosomes are influenced by?

- A. Environmental factors
- B. Secondary invaders
- C. Microorganisms
- D. Disease
- E. Chemical reactions
- F. None of the Above

Bacteria

20. Bacteria are prokaryotes (Kingdom Monera), which means that they have No true nucleus. They do have one chromosome of double-stranded DNA in a ring.

- A. True
- B. False

21. There are some bacteria relatives that can do photosynthesis--they don't have chloroplasts, but their _____ and other needed chemicals are built into their cell membranes.

- A. Chlorophyll
- B. An organelle
- C. Cellulose
- D. Double-stranded DNA
- E. Bacilli
- F. None of the Above

22. Bacteria consist of only?

- A. Chloroplasts
- B. An organelle
- C. Cellulose
- D. Double-stranded DNA
- E. A single cell
- F. None of the Above

23. Pathogens have been found that can live in temperatures above the boiling point and in cold that would freeze your blood. They "eat" everything from sugar and starch to sunlight, sulfur and iron.

- A. True
- B. False

Prokaryotes

24. The only prokaryotes are Bacteria and archaea all other life forms are _____ creatures whose cells have nuclei.

- A. Bacteria
- B. Peptidoglycan
- C. Bacilli
- D. Eukaryotes
- E. Microorganism
- F. None of the Above

Early Origins

25. Bacteria, are basically one of three different shapes, some are rod - or stick-shaped and called Bacilli. Others are shaped like little balls and called cocci (cox-eye).

- A. True B. False

26. According to the text, bacterial cells exist as individuals while others cluster together to form?

- A. AN organism D. Pairs, chains, squares or other groupings
B. An organelle E. Helical or spiral in shape
C. Cellulose F. None of the Above

27. The mitochondria that make energy for your body cells is one example of?

- A. Chloroplasts D. Bacilli
B. An organelle E. Eukaryote(s)
C. Cellulose F. None of the Above

28. A single teaspoon of topsoil contains more than a billion (1,000,000,000) bacteria.

- A. True B. False

Peptidoglycan

29. The amount and location of the _____ are different in the two possible types of cell walls, depending on the species of bacterium.

- A. Capsule D. Cell membrane/plasma membrane/cytoplasmic membrane
B. Peptidoglycan E. True nucleus
C. Cytoplasmic granules F. None of the Above

30. Penicillin, inhibit the formation of the chemical cross linkages needed to make?

- A. Disease(s) D. Peptidoglycan
B. Mutation(s) E. Bacteria
C. Carriers F. None of the Above

31. If a person stops an antibiotic, any living bacteria could start making _____, grow, and reproduce.

- A. Bacteria D. Germ theory of disease
B. Peptidoglycan E. Microorganism
C. Eukaryotes F. None of the Above

Metabolism

32. Which of the following is a term that describes all the chemical reactions by which food is transformed for use by the cells?

- A. Fastidious D. Germ theory of disease
B. Metabolism E. Osmosis
C. Chemical reactions F. None of the Above

33. A cell can grow through its metabolism, reproduce and it can respond to changes in its environment.

- A. True B. False

Gram Stain

34. One of the two possible types of _____ has more peptidoglycan than the other.

- A. Bacteria
- B. Peptidoglycan
- C. Gram⁺ or Gram⁻
- D. Bacterial cell walls
- E. Gram stain
- F. None of the Above

35. Which type of bacteria often incorporate toxic chemicals into their cell walls, and thus tend to cause worse reactions in our bodies?

- A. Positive
- B. Fastidious
- C. Gram⁺ or Gram⁻
- D. Gram⁺
- E. Gram⁻
- F. None of the Above

36. Which of the bacteria have less peptidoglycan, antibiotics like penicillin are less effective against them?

- A. Positive
- B. Fastidious
- C. Gram⁺ or Gram⁻
- D. Gram⁺
- E. Gram⁻
- F. None of the Above

37. Pseudomonas aeruginosa is a strictly aerobic, oxidase positive, non-fermentative bacterium are?

- A. Positive
- B. Fastidious
- C. Gram⁺ or Gram⁻
- D. Gram⁺
- E. Gram negative
- F. None of the Above

38. In the Gram process, the amount of peptidoglycan in the cell walls of the bacteria under study will determine how those bacteria absorb the dyes with which they are stained; thus, bacterial cells can be Gram⁺ or Gram⁻.

- A. True
- B. False

39. Which type of bacteria have simpler cell walls with lots of peptidoglycan, and stain a dark purple color?

- A. Aerobic
- B. Positive
- C. Gram⁺ or Gram⁻
- D. Gram⁺
- E. Gram⁻
- F. None of the Above

40. Which type of bacteria have more complex cell walls with less peptidoglycan, thus absorb less of the purple dye used and stain a pinkish color?

- A. Positive
- B. Fastidious
- C. Gram⁺ or Gram⁻
- D. Gram⁺
- E. Gram⁻
- F. None of the Above

41. The Gram-stain appearance is not particularly characteristic although rods are somewhat thinner than those seen for the?

- A. Coliform bacteria
- B. Enteric-like bacteria
- C. Standard plate count
- D. HPC
- E. CFU
- F. None of the Above

Two types of cells- Prokaryotes and Eucaryotes

42. Which of the following terms exhibits all the characteristics of life but it lacks the complex system of membranes and organelles?

- A. Coliform bacteria
- B. Enteric-like bacteria
- C. Standard plate count
- D. HPC
- E. CFU
- F. None of the Above

43. Which cell has a complex structure, containing a true nucleus and many membrane bound organelles?

- A. Eukaryote(s)
- B. Vesicles
- C. Prokaryote(s)
- D. Protozoan
- E. Paramecium
- F. None of the Above

Structure of a Eukaryotic Cell

44. Cell Membrane: The cell is enclosed and held intact by the cell membrane/plasma membrane/cytoplasmic membrane and is composed of large molecules of proteins and?

- A. Capsule
- B. Cell wall
- C. Cytoplasmic granules
- D. Phospholipids
- E. True nucleus
- F. None of the Above

45. Which of the following terms is selectively permeable?

- A. Cytoplasmic granules
- B. Cellular membrane
- C. Cell wall
- D. A single circular DNA molecule
- E. DNA and proteins
- F. None of the Above

Nucleus

46. Which of the following terms is enclosed in the nuclear membrane and contains chromosomes?

- A. Chromosomes
- B. Nucleus
- C. Cell membrane
- D. Macromolecular polymer-peptidoglycan
- E. Cytoplasmic organelles
- F. None of the Above

47. A single circular DNA molecule consists of many genes. A gene is a coiled unit made up of Cytoplasmic granules and proteins that code for or determine a particular characteristic of an individual organism.

- A. True
- B. False

Cytoplasm

48. Cytoplasm is composed of a semifluid gelatinous nutrient matrix and cytoplasmic organelles including endoplasmic reticulum, ribosomes, Golgi complex, mitochondria, _____, microtubules, lysosomes and vacuoles.

- A. Chromosomes
- B. Prokaryotes
- C. Cell membrane
- D. Centrioles
- E. Cytoplasmic organelles
- F. None of the Above

Cell Wall

49. Which of the following is found as an external structure of plant cells, algae, and fungi?

- A. Cytoplasmic granules
- B. Cilia
- C. A cell wall
- D. A single circular DNA molecule
- E. DNA and proteins
- F. None of the Above

Cilia and Flagella

50. Which of the following terms express cells that possess relatively long and thin structures called Flagella?

- A. Eukaryotic
- B. Vesicles
- C. Prokaryotic
- D. Protozoan
- E. Paramecium
- F. None of the Above

51. Which of the following terms are also organs of locomotion but are shorter and more numerous?

- A. Cytoplasmic granules
- B. Cilia
- C. A cell wall
- D. Flagella
- E. Hair
- F. None of the Above

Structure of a Prokaryotic Cell

52. All bacteria are prokaryotes and are simple cells and they divide by binary fission.

- A. True
- B. False

Chromosome

53. The chromosome of a prokaryotic cell usually consists of a single circular _____ and serves as the control center of the bacterial cell.

- A. Cytoplasmic granules
- B. DNA molecule
- C. A cell wall
- D. A single circular DNA molecule
- E. DNA and proteins
- F. None of the Above

54. A typical bacterial chromosome contains approximately 10,000 genes.

- A. True
- B. False

Cytoplasm

55. Which of the following terms is a semi-liquid that surrounds the chromosome and is contained within the plasma membrane?

- A. Chromosomes
- B. Cytoplasm
- C. Cell membrane
- D. Macromolecular polymer-peptidoglycan
- E. Cytoplasmic organelles
- F. None of the Above

56. Which of the following terms occur in certain species of bacteria which can be specifically stained and used to identify the bacteria?

- A. Cytoplasm
- B. Cell wall
- C. Cytoplasmic granules
- D. Cell membrane/plasma membrane/cytoplasmic membrane
- E. True nucleus
- F. None of the Above

Cell Membrane

57. The Cell Membrane is similar to that of the?

- A. Chromosomes
- B. Prokaryotes
- C. Eukaryotic cell membrane
- D. Macromolecular polymer-peptidoglycan
- E. Cytoplasmic organelles
- F. None of the Above

58. Which of the following is selectively permeable and controls the substances entering or leaving the cell?
- A. Chromosomes
 - B. Procaryotes
 - C. Eukaryotic cell membrane
 - D. Macromolecular polymer-peptidoglycan
 - E. Cytoplasmic organelles
 - F. None of the Above

Capsules

59. Some bacteria have a layer of material outside the?
- A. Capsule
 - B. Cell wall
 - C. Cytoplasmic granules
 - D. Cell membrane/plasma membrane/cytoplasmic membrane
 - E. True nucleus
 - F. None of the Above
60. Which of the following terms, is highly organized and firmly attached, this layer is called a capsule or if it is not highly organized and not firmly attached, a slime layer?
- A. Capsule
 - B. Cell wall
 - C. Cytoplasmic granules
 - D. DNA and proteins
 - E. True nucleus
 - F. None of the Above
61. Which of the following terms consist of complex sugars or polysaccharides combined with lipids and proteins?
- A. Cytoplasmic granules
 - B. Cilia
 - C. A cell wall
 - D. Capsules
 - E. DNA and proteins
 - F. None of the Above
62. Which of the following terms is useful in differentiating between different types of bacteria?
- A. Capsule
 - B. Cell wall
 - C. Cytoplasmic granules
 - D. Cell membrane/plasmamembrane/cytoplasmic
 - E. True nucleus
 - F. None of the Above
63. Which of the following terms are usually detected by negative staining, where the bacterial cell and the background become stained but the capsule remains unstained?
- A. Cytoplasmic granules
 - B. Capsules
 - C. Encapsulated bacteria
 - D. A single circular DNA molecule
 - E. DNA and proteins
 - F. None of the Above
64. Encapsulated bacteria produce colonies on Flagellated bacteria are smooth, mucoid and glistening, whereas the capsulated bacteria produce rough and dry colonies.
- A. True
 - B. False
65. Capsules enable the bacterial species to attach to mucus membranes and protect the bacteria from phagocytosis.
- A. True
 - B. False

Flagella

66. Peritrichous bacteria- possess?
- A. One flagellum at each end
 - B. Tuft of flagella
 - C. The entire surface
 - D. Genetic material from one bacteria
 - E. Flagella over the entire surface
 - F. None of the Above

67. Flagella are _____ that enable the bacteria to move.

- A. Cytoplasmic granules
- B. Cilia
- C. Thread-like proteins
- D. False feet
- E. Hair
- F. None of the Above

68. The following term is said to be motile while non-flagellated bacteria are generally non-motile.

- A. Bacteria
- B. Peptidoglycan
- C. Gram⁺ or Gram⁻
- D. Flagellated bacteria
- E. Microorganism
- F. None of the Above

69. Lophotrichous bacteria-possess at one or both ends?

- A. Forming spores
- B. Spore formation
- C. A single polar flagellum
- D. Tuft of flagella
- E. Cilia
- F. None of the Above

70. Amphitrichous bacteria-bacteria with?

- A. One flagellum at each end
- B. A single polar flagellum
- C. The entire surface
- D. Transfer genetic material from one bacteria cell to another
- E. One or both ends
- F. None of the Above

71. Monotrichous bacteria-bacteria with?

- A. One flagellum at each end
- B. A single polar flagellum
- C. The entire surface
- D. Genetic material from one bacteria cell to another
- E. One or both ends
- F. None of the Above

Pili or Fimbriae

72. Pili or Fimbriae enable the bacteria to attach to other bacteria or to membrane surfaces such as intestinal linings or?

- A. Chromosomes
- B. RBC
- C. Cell membrane
- D. Macromolecular polymer-peptidoglycan
- E. Cytoplasmic organelles
- F. None of the Above

73. Which of the following terms is used to transfer genetic material from one bacteria cell to another?

- A. Chromosomes
- B. Pili or Fimbriae
- C. Cell membrane
- D. Macromolecular polymer-peptidoglycan
- E. Cytoplasmic organelles
- F. None of the Above

Spores

74. Which of the following terms is enclosed in several protein coats that are resistant to heat, drying and most chemicals?

- A. Spores
- B. Genetic material
- C. Cytoplasmic granules
- D. Spore formation
- E. Macromolecular polymer-peptidoglycan
- F. None of the Above

75. Which of the following terms lands on a nutrient rich surface, can form a new vegetative cell?

- A. Spores
- B. Genetic material
- C. Several protein coats
- D. Spore formation
- E. Dried spore
- F. None of the Above

76. Spore formation is related to the survival of bacterial cells, not reproduction.

- A. True
- B. False

Bacterial Nutrition

77. Which of the following terms may in significant quantities, but some seem to only need it in trace amounts?

- A. Water
- B. Nitrogen
- C. Iron, Zinc, Cobalt
- D. Oxygen
- E. Calcium
- F. None of the Above

78. Which of the following terms all life requires in order to grow and reproduce?

- A. Water
- B. Copper
- C. Iron, Zinc, Cobalt
- D. Oxygen
- E. Calcium
- F. None of the Above

79. Which of the following terms are required by some enzymes to function?

- A. Water
- B. Copper
- C. Iron, Zinc, Cobalt
- D. Oxygen
- E. Calcium
- F. None of the Above

80. All life has the same basic nutritional requirements which include: Energy. This may be light or inorganic substances like sulfur, carbon monoxide or ammonia, or preformed organic matter like sugar, protein, fats etc.

- A. True
- B. False

81. Which of the following terms may be nitrogen gas, ammonia, nitrate/nitrite, or a nitrogenous organic compound like protein or Nucleic acid?

- A. Water
- B. Nitrogen
- C. Iron, Zinc, Cobalt
- D. Oxygen
- E. Calcium
- F. None of the Above

82. Which of the following terms may be carbon dioxide, methane, carbon monoxide, or a complex organic material?

- A. Water
- B. Carbon
- C. Iron, Zinc, Cobalt
- D. Oxygen
- E. Calcium
- F. None of the Above

83. Which of the following terms may require gaseous air?

- A. Water
- B. DNA molecule
- C. Iron, Zinc, Cobalt
- D. Oxygen
- E. Calcium
- F. None of the Above

Fastidious

84. Which of the following terms may synthesize every complex molecule they need from the basic minerals,

- A. Eukaryote(s)
- B. Bacteria
- C. Prokaryote(s)
- D. Centrioles
- E. Viruses
- F. None of the Above

85. Which of the following terms are said to be fastidious, require preformed organic molecules like vitamins, amino acids, nucleic acids, carbohydrates?

- A. Eukaryote(s)
- B. Bacteria
- C. Prokaryote(s)
- D. Centrioles
- E. Viruses
- F. None of the Above

What in the World is an Eukaryote?

86. Which of the following terms represents animals, plants, and fungi, which are mostly multicellular, as well as various other groups called protists, many of which are unicellular?

- A. Eukaryote(s)
- B. Bacteria
- C. Prokaryote(s)
- D. Centrioles
- E. Viruses
- F. None of the Above

87. Which of the following terms represents organisms such as bacteria lack nuclei and other complex cell structures?

- A. Eukaryote(s)
- B. Bacteria
- C. Prokaryote(s)
- D. Centrioles
- E. Viruses
- F. None of the Above

88. The eukaryotes share a common origin, and are often treated formally as a super kingdom, empire, or domain.

- A. True
- B. False

Eukaryotic Cells

89. According to the text, Eukaryotic cells are generally much larger than _____, typically with a thousand times their volumes.

- A. Eukaryote(s)
- B. Bacteria
- C. Prokaryote(s)
- D. Centrioles
- E. Viruses
- F. None of the Above

90. Many cells ingest food and other materials through a process of osmosis, where the outer membrane invaginates and then pinches off to form a Flagella.

- A. True
- B. False

91. Which of the following terms is surrounded by a double membrane, with pores that allow material to move in and out?

- A. The nucleus
- B. Flagella
- C. DNA molecule
- D. Cilia
- E. Cell wall
- F. None of the Above

92. Which of the following terms represents a variety of Internal membranes and structures, called organelles, and a cytoskeleton composed of microtubules and microfilaments?

- A. Eukaryote(s)
- B. Bacteria
- C. Prokaryote(s)
- D. Centrioles
- E. Viruses
- F. None of the Above

93. Which of the following terms represent this DNA which is divided into several bundles called chromosomes, which are separated by a microtubular spindle during nuclear division?

- A. Eukaryote(s)
- B. Bacteria
- C. Prokaryote(s)
- D. Centrioles
- E. Viruses
- F. None of the Above

94. Which of the following terms represent cells that include a variety of membrane-bound structures, collectively referred to as the endomembrane system.

- A. Eukaryote(s)
- B. Golgi bodies or dictyosomes
- C. Prokaryote(s)
- D. Centrioles
- E. Eukaryotic
- F. None of the Above

Protozoan Reservoirs of Disease

95. Which of the following bugs/disease/causes terms represents the causative organism of Legionnaires' disease?

- A. Centrioles
- B. Viruses
- C. Autotrophic
- D. Amoebae
- E. Bacterium Legionella pneumophila
- F. None of the Above

96. Which of the following bugs/disease/causes terms live and reproduce in the cytoplasm of some free-living amoebae?

- A. Centrioles
- B. Viruses
- C. Autotrophic
- D. Amoebae
- E. Bacterium Legionella pneumophila
- F. None of the Above

97. The presence of bacteria in the cytoplasm of protozoa is well known, whereas that of viruses is less frequently reported. Most of these reports simply record the presence of bacteria or viruses and assume some sort of symbiotic relationship between them and the Protozoa.

- A. True
- B. False

98. Which of the following terms were shown to not only survive but also to multiply in the cytoplasm of free-living, nonpathogenic protozoa?

- A. Human pathogens
- B. Foraminifera
- C. Freshwater protozoan
- D. Soil-dwelling protozoa
- E. Marine protozoa
- F. None of the Above

99. Protozoa are the natural habitat for certain pathogenic bacteria.

- A. True
- B. False

Symbionts

100. Which of the following terms inhabit the rumen and reticulum of ruminates and the cecum and colon of equids?

- A. Protozoa
- B. Foraminifera
- C. Freshwater protozoan
- D. Soil-dwelling protozoa
- E. Ciliates
- F. None of the Above

Viruses

101. Which term are acellular microorganisms, made up of only genetic material and a protein coat?

- A. Viruses
- B. Genetic material
- C. Poxviruses
- D. Antiviral therapies
- E. Virions
- F. None of the Above

102. Which term depend on the energy and metabolic machinery of the host cell to reproduce?

- A. Fungi
- B. Genetic material
- C. Poxviruses
- D. Virus(es)
- E. Virions
- F. None of the Above

103. Viruses are found in virtually all life forms, including humans, animals, plants, _____, and bacteria.

- A. Fungi
- B. Genetic material
- C. Poxviruses
- D. Antiviral therapies
- E. Virions
- F. None of the Above

104. According to the text, viruses consist of genetic material—either _____ or ribonucleic acid (RNA)—surrounded by a protective coating of protein, called a capsid, with or without an outer lipid envelope.

- A. Deoxyribonucleic acid (DNA)
- B. Genetic material
- C. Poxviruses
- D. Antiviral therapies
- E. Virions
- F. None of the Above

105. Which of the following terms are between 20 and 100 times smaller than bacteria and hence are too small to be seen by light microscopy?

- A. Viruses
- B. Genetic material
- C. Poxviruses
- D. Fungi
- E. Virions
- F. None of the Above

106. Which of the following terms vary in size from the largest poxviruses of about 450 nanometers in length to the smallest polioviruses of about 30 nanometers?

- A. Viruses
- B. Genetic material
- C. Poxviruses
- D. Bacteria
- E. Virions
- F. None of the Above

107. Which of the following terms are not considered free-living, since they cannot reproduce outside of a living cell; they have evolved to transmit their genetic information from one cell to another for the purpose of replication?

- A. Viruses
- B. Genetic material
- C. Poxviruses
- D. Bacteria
- E. Virions
- F. None of the Above

108. Which of the following terms often damage or kill the cells that they infect, causing disease in infected organisms?

- A. Viruses
- B. Genetic material
- C. Poxviruses
- D. Antiviral therapies
- E. Virions
- F. None of the Above

109. Because of the difficulty in developing antiviral therapies stems from the large number of variant _____ that can cause the same disease, as well as the inability of drugs to disable a virus without disabling healthy cells.

- A. Viruses
- B. Genetic material
- C. Poxviruses
- D. Antiviral therapies
- E. Virions
- F. None of the Above

110. With the development of antiviral agents is a major focus of current research, and the study of _____ has led to many discoveries important to human health.

- A. Viruses
- B. Genetic material
- C. Poxviruses
- D. Antiviral therapies
- E. Virions
- F. None of the Above

111. A few viruses stimulate cells to grow uncontrollably and produce cancers. Although many infectious diseases, such as the common cold, are caused by viruses, there are no cures for these illnesses.

- A. True
- B. False

Virions

112. Which of the following terms is a complete functional virus that has the capacity to infect living tissue?

- A. Podoviruses
- B. Phage's host range
- C. Myovirus bacteriophages
- D. Phage lambda of E. coli
- E. A virion
- F. None of the Above

113. If the cell was burst artificially, then these virus particles cannot be called virion because they will lack certain proteins that will make them infectious even though the _____ is present.

- A. Podoviruses
- B. Phage's host range
- C. Myovirus bacteriophages
- D. Genetic material
- E. Viral genome
- F. None of the Above

114. According to the text, biomolecules found in virions: genetic material, _____, single or double stranded, nucleoprotein capsid.

- A. Either DNA or RNA
- B. Phage's host range
- C. Myovirus bacteriophages
- D. Phage lambda of E. coli
- E. Viral genome
- F. None of the Above

Bacteriophage

115. According to the text, bacteriophages consist of _____ enclosing genetic material.

- A. Bacteriophages
- B. Phages
- C. Microbial mats
- D. Peptidoglycan
- E. An outer protein hull
- F. None of the Above

116. One of the densest natural sources for phages and other viruses is sea water, where up to 9×10^8 virions per milliliter have been found in _____ at the surface, and up to 70% of marine bacteria may be infected by phages.

- A. Bacteriophages
- B. Phages
- C. Microbial mats
- D. Peptidoglycan
- E. Virions
- F. None of the Above

117. The genetic material can be ssRNA (single stranded RNA), dsRNA, ssDNA, or dsDNA between 5 and 500 kilo base pairs long with linear arrangement. Bacteriophages are much smaller than the Plasma membrane they destroy - usually between 20 and 200 nm in size.

- A. True
- B. False

118. Which creature or substance is estimated to be the most widely distributed and diverse entities in the biosphere?

- A. Bacteriophages
- B. Phages
- C. Microbial mats
- D. Peptidoglycan
- E. Virions
- F. None of the Above

119. Which creature or substance is ubiquitous and can be found in all reservoirs populated by bacterial hosts, such as soil or the intestine of animals?

- A. Host cell secretion
- B. Phage(s)
- C. Lysogenic
- D. Plasma membrane
- E. Bacterial hosts
- F. None of the Above

120. Phages may be released via cell lysis or by?

- A. Host cell secretion
- B. Phage(s)
- C. Lysogenic
- D. Plasma membrane
- E. Bacterial hosts
- F. None of the Above

121. Which phages does not kill the host but rather become long-term parasites and make the host cell continually secrete more new virus particles?

- A. Host cell secretion
- B. Phage(s)
- C. Lysogenic
- D. Plasma membrane
- E. Bacterial hosts
- F. None of the Above

Protozoa

122. When protozoa are in the form of _____, they actively feed and grow.

- A. Cysts
- B. Trophozoites
- C. Pathogens
- D. Hermaphroditic
- E. Apicomplexans
- F. None of the Above

123. Which bug/creature/organism/species play a role both as herbivores and as consumers in the decomposer link of the food chain?

- A. Protozoa
- B. Malaria parasites
- C. Microinvertebrates
- D. Algal production
- E. Trophozoites and cysts
- F. None of the Above

124. Which bug/creature/organism/species are an important food source for microinvertebrates?

- A. Meiofauna
- B. Malaria parasites
- C. Microinvertebrates
- D. Algal production
- E. Protozoa
- F. None of the Above

125. The ecological role of protozoa in the transfer of bacterial and _____ to successive trophic levels is important.

- A. Protozoa
- B. Malaria parasites
- C. Microinvertebrates
- D. Algal production
- E. Trophozoites and cysts
- F. None of the Above

126. According to the text, the process by which the protozoa takes its cyst form is called encystation, while the process of transforming back into _____ is called excystation.

- A. Cysts
- B. Trophozoite
- C. Pathogens
- D. Hermaphroditic
- E. Apicomplexans
- F. None of the Above

127. Protozoa occupy a range of trophic levels, as predators, they prey upon unicellular or filamentous algae, bacteria, and?

- A. Microfungi
- B. Malaria parasites
- C. Microinvertebrates
- D. Algal production
- E. Trophozoites and cysts
- F. None of the Above

128. Most protozoa exist in 5 stages of life which are in the form of _____.

- A. Protozoa
- B. Malaria parasites
- C. Microinvertebrates
- D. Algal production
- E. Trophozoites and cysts
- F. None of the Above

129. Which bug/creature/organism/species can survive harsh conditions, such as exposure to extreme temperatures and harmful chemicals, or long periods without access to nutrients, water, or oxygen for a period of time.

- A. Protozoa
- B. Malaria parasites
- C. Microinvertebrates
- D. Algal production
- E. Trophozoites and cysts
- F. None of the Above

130. An individual protozoan is?

- A. Cysts
- B. Trophozoite
- C. Pathogens
- D. Hermaphroditic
- E. Apicomplexans
- F. None of the Above

131. Which bug/creature/organism/species are around 10–50 micrometer, but can grow up to 1 mm and can easily be seen under a microscope.

- A. Protozoa
- B. Malaria parasites
- C. Microinvertebrates
- D. Algal production
- E. Trophozoites and cysts
- F. None of the Above

132. Which bug/creature/organism/species exist throughout aqueous environments and soil.

- A. Protozoa
- B. Malaria parasites
- C. Microinvertebrates
- D. Algal production
- E. Trophozoites and cysts
- F. None of the Above

Ecological Role of Protozoa

133. Which of the following terms represents an organism which is frequently overlooked, these play an important role in many communities where they occupy a range of trophic levels?

- A. Protozoa
- B. Foraminifera
- C. Freshwater protozoan
- D. Fossil foraminifera
- E. Marine protozoa
- F. None of the Above

134. According to the text, these are predators of unicellular or filamentous algae, _____, and microfungi, protozoa play a role both as herbivores and as consumers in the decomposer link of the food chain.

- A. Bacteria
- B. Many ecological conditions
- C. Amazingly diverse organisms
- D. Pathogenic bacteria
- E. Bacterium
- F. None of the Above

135. The ecological role of Foraminifera in the transfer of bacterial and algal production to successive trophic levels is important.

- A. True
- B. False

Factors Affecting Growth and Distribution

136. Which of the following terms reproduce by cell division?

- A. Most free-living protozoa
- B. Foraminifera
- C. Freshwater protozoan
- D. Fossil foraminifera
- E. Marine protozoa
- F. None of the Above

Wastewater Bug Section

137. In the Activated Sludge process, the _____ are also called waste activated sludge.

- A. Organisms
- B. Settled bugs
- C. Mixed liquor
- D. Secondary treatment
- E. Sludge Volume Index
- F. None of the Above

138. The waste sludge is treated separately. The remaining wastewater is now much cleaner. In fact, after primary and _____, about 85% or more of all pollutants in the wastewater has been removed and it goes on to Disinfection.

- A. Oxygen
- B. Settled bugs
- C. Activated sludge
- D. Secondary treatment
- E. Settleable Solids
- F. None of the Above

139. The first group is the bacteria which eat the dissolved organic compounds is generally four (4) groups of bugs that do most of the "eating" in this process.

- A. Mixed liquor
- B. Settled bugs
- C. Activated sludge
- D. Secondary treatment
- E. Total Dissolved Solids
- F. None of the Above

140. The second and third groups of bugs are microorganisms known as the free-swimming and?

- A. Mixed liquor
- B. Suctoria
- C. Stalked ciliates
- D. Bacteria
- E. Volatile Solids
- F. None of the Above

141. This bug which feeds on the larger bugs and assist with settling is in the fourth group, known as?

- A. Water bear
- B. Suctoria
- C. Activated sludge bugs
- D. Rotifer
- E. Vorticella
- F. None of the Above

142. The Bacteria have several interesting properties--their "fat reserve" is stored on the outside of their body and this strange feature?

- A. Fur
- B. Feet
- C. Eyes
- D. No Mouth
- E. No Cilia
- F. None of the Above

143. Once the bacteria have "contacted" their food, they start the digestion process, a chemical Enzyme is sent out through the cell wall to break up the?

- A. Mixed liquor
- B. Organic compounds
- C. Activated sludge
- D. Bacteria
- E. Total Dissolved Solids
- F. None of the Above

144. The cell is highly engineered and because of this hydrolytic enzyme, it breaks the organic molecules into small units which are able to pass through the cell wall of the?

- A. Mixed bugs
- B. Compound
- C. Organism
- D. Bacteria
- E. Protozoan
- F. None of the Above

145. In wastewater treatment, the process of using bacteria-eating-bugs in the presence of oxygen to reduce the organics in water is called?

- A. Mixed liquor
- B. Oxidation
- C. Activated sludge
- D. Reduction
- E. Settleable Solids
- F. None of the Above

146. Activated Sludge: The first step in the process, the contact of the bacteria with the organic compounds, takes about?

- A. 24 hours
- B. 2 Hours
- C. 1 Hour
- D. 30 Minutes
- E. 72 Hours
- F. None of the Above

147. An asset in settling the bug is its fat storage property and as the bugs "bump" into each other, the fat on each of them sticks together and causes flocculation of the?

- A. Mixed liquor
- B. Floc
- C. Non-organic solids and biomass
- D. WAS
- E. Settleable Solids
- F. None of the Above

148. What does facultative mean as far as bugs? What environments are they adaptable to survive and multiply in?

- A. Either anaerobic or aerobic conditions
- B. Anaerobic only
- C. Facultative
- D. Aerobic only
- E. Volatile
- F. None of the Above

149. The next step as in the text, this substance, which is the activated sludge, is used again by returning it to the influent of the aeration tank for mixing with the primary effluent and ample amounts of air?

- A. Carry over
- B. RAS
- C. Solids biomass
- D. Super WAS
- E. Sludge Volume Index
- F. None of the Above

150. We need to be able to properly identify the bugs and this common bugs are a medium size to large swimming Ciliate, commonly observed in activated sludge, sometimes in abundant numbers.

- A. Vorticella
- B. Euglypha
- C. Paramecium
- D. Euchlanis
- E. Rotifer
- F. None of the Above

Giardiasis Giardia lamblia

151. According to the text, Giardia lamblia (intestinalis) is a single celled animal, i.e., a protozoan, that moves with the aid of five flagella. In Europe, it is sometimes referred to as?

- A. Chronic cases
- B. The organism
- C. Lamblia intestinalis
- D. Typically, the disease
- E. Morphologically distinct organism
- F. None of the Above

152. Giardiasis is the most frequent cause of non-bacterial diarrhea in North America. Giardia duodenalis, cause of giardiasis, is a one-celled, Microscopic parasite that can live in the intestines of animals and people. It is found in every region throughout the world and has become recognized as one of the most common causes of waterborne (and occasionally foodborne) illness often referred to as "Beaver Fever."

- A. True
- B. False

153. Approximately one week after ingestion of the _____, prolonged, greasy diarrhea, gas, stomach cramps, fatigue, and weight loss begin.

- A. Intestinal flora
- B. Giardia cysts
- C. Human giardiasis
- D. Various degrees of symptoms
- E. The microaerophilic Giardia
- F. None of the Above

154. The basic biology of this _____--including how it ravages the digestive tract--is poorly understood.

- A. Chronic case
- B. Organism
- C. Parasite
- D. Disease
- E. Morphologically distinct organism
- F. None of the Above

155. Which of the following terms uses these mitosomes in the maturation of iron-sulfur proteins rather than in ATP synthesis as is the case in mitochondria-possessing eukaryotes?

- A. Intestinal flora
- B. The disease mechanism
- C. Human giardiasis
- D. Various degrees of symptoms
- E. Microaerophilic Giardia
- F. None of the Above

Nature of Disease

156. Which of the following terms that appear identical to those that cause human illness have been isolated from domestic animals and wild animals.

- A. Chronic cases
- B. The organism
- C. *Lambliia intestinalis*
- D. Typically, the disease
- E. Organisms
- F. None of the Above

157. Which of the following terms may involve diarrhea within 1 week of ingestion of the cyst, which is the environmental survival form and infective stage of the organism?

- A. Intestinal flora
- B. The disease mechanism
- C. Human giardiasis
- D. Various degrees of symptoms
- E. The microaerophilic Giardia
- F. None of the Above

158. Chronic cases, both those with defined _____ and those without, are difficult to treat.

- A. Immune deficiencies
- B. The organism
- C. *Lambliia intestinalis*
- D. Typically, the disease
- E. Morphologically distinct organism
- F. None of the Above

159. Which of the following terms is unknown, with some investigators reporting that the organism produces a toxin while others are unable to confirm its existence?

- A. Intestinal flora
- B. The disease mechanism
- C. Human giardiasis
- D. Various degrees of symptoms
- E. The microaerophilic Giardia
- F. None of the Above

160. Which of the following terms has been demonstrated inside host cells in the duodenum, but most investigators think this is such an infrequent occurrence that it is not responsible for disease symptoms?

- A. Intestinal flora
- B. The organism
- C. *Lambliia intestinalis*
- D. Typically, the disease
- E. Morphologically distinct organism
- F. None of the Above

161. Which of the following terms of the absorptive surface of the intestine has been proposed as a possible pathogenic mechanism, as has a synergistic relationship with some of the intestinal flora?

- A. Intestinal flora
- B. The disease mechanism
- C. Human giardiasis
- D. Various degrees of symptoms
- E. Mechanical obstruction
- F. None of the Above

162. Which of the following terms can be excysted, cultured and encysted in vitro; new isolates have bacterial, fungal, and viral symbionts?

- A. Intestinal flora
- B. The organism
- C. *Lamblia intestinalis*
- D. Typically, the disease
- E. *Giardia*
- F. None of the Above

163. Which of the following terms have been isolated and described through analysis of their proteins and DNA; type of strain, however, is not consistently associated with disease severity?

- A. Several strains of *G. lamblia*
- B. The disease mechanism
- C. Human giardiasis
- D. Various degrees of symptoms
- E. The microaerophilic *Giardia*
- F. None of the Above

164. Different individuals show various degrees of symptoms when infected with the same strain, and the symptoms of an individual may vary during the?

- A. Intestinal flora
- B. Disease mechanism
- C. Human giardiasis
- D. Various degrees of symptoms
- E. Course of the disease
- F. None of the Above

Giardiasis *Giardia lamblia* Chapter 2 Diagnosis of Human Illness

165. *Giardia lamblia* is frequently diagnosed by visualizing the organism, either the trophozoite or the cyst in stained preparations or unstained wet mounts with the aid of a microscope.

- A. True
- B. False

166. Which of the following terms may be concentrated by sedimentation or flotation; however, these procedures reduce the number of recognizable organisms in the sample?

- A. Organisms
- B. Infective cysts
- C. Acute outbreaks
- D. Giardiasis
- E. Recognizable organisms in the sample
- F. None of the Above

167. Which of the following terms that detects excretory secretory products of the organism is also available?

- A. Bac-T
- B. An enzyme
- C. Lab array
- D. Infective cysts
- E. An enzyme linked immunosorbant assay (ELISA)
- F. None of the Above

Relative Frequency of Disease

168. Which of the following terms is more prevalent in children than in adults, possibly because many individuals seem to have a lasting immunity after infection?

- A. *Cryptosporidium*
- B. An enzyme
- C. Giardiasis
- D. Infective cysts
- E. Trophozoite
- F. None of the Above

169. Which of the following terms is implicated in 25% of the cases of gastrointestinal disease and may be present asymptotically, the overall incidence of infection is estimated at 2% of the population.

- A. Cryptosporidium
- B. An enzyme
- C. Giardiasis
- D. Infective cysts
- E. Trophozoite
- F. None of the Above

170. Which of the following terms appear to be common with infants and is not usually associated with water but is related to child care and diaper changing hygiene procedures.

- A. Flagyl
- B. Infective cysts
- C. Acute outbreaks
- D. Giardiasis
- E. Intestinal flora
- F. None of the Above

171. According to the text, this is an example of infectious diarrhea due to _____ infection of the small intestine.

- A. This organism
- B. Giardia lamblia
- C. Giardiasis
- D. Infective cysts
- E. The small pear-shaped trophozoites
- F. None of the Above

172. Which of the following terms in immunodeficient and normal individuals are frequently refractile to drug treatment?

- A. This organism
- B. An enzyme
- C. Giardiasis
- D. Infective cysts
- E. Chronic cases of giardiasis
- F. None of the Above

173. Which of the following terms is normally quite effective in terminating infections?

- A. Flagyl
- B. Infective cysts
- C. Acute outbreaks
- D. Giardiasis
- E. Recognizable organisms in the sample
- F. None of the Above

Target Populations

174. Which of the following terms occurs throughout the population, although the prevalence is higher in children than adults?

- A. This organism
- B. An enzyme
- C. Giardiasis
- D. Infective cysts
- E. The small pear-shaped trophozoites
- F. None of the Above

175. Chronic symptomatic giardiasis is more common in adults than children.

- A. True
- B. False

Cryptosporidiosis Cryptosporidium Chapter 3

176. Which bug or disease term describes the following symptoms, watery diarrhea and cramps, sometimes severe, weight loss, nausea, vomiting, and fever are also possible?

- A. Agammaglobulinemia
- B. Toxoplasmosis
- C. Malaise
- D. Cryptosporidiosis
- E. Anti-water Infection
- F. None of the Above

177. Cryptosporidium is a protozoan pathogen of the Phylum Apicomplexa and causes a diarrheal illness called?

- A. Cryptosporidium parvum
- B. Cryptosporidiosis
- C. AIDS
- D. Congenital agammaglobulinemia
- E. Cryptosporidium
- F. None of the Above

178. Apicomplexan pathogens include the malaria parasite Plasmodium, and Toxoplasma, the causative agent of?

- A. Cryptosporidium parvum
- B. Cryptosporidiosis
- C. Toxoplasmosis
- D. Congenital agammaglobulinemia
- E. Cryptosporidium
- F. None of the Above

179. Few people had heard of _____, or the disease it causes, cryptosporidiosis that until 1993, when over 400,000 people in Milwaukee became ill with diarrhea after drinking water contaminated with the parasite,

- A. Cryptosporidium parvum
- B. Cryptosporidiosis
- C. AIDS
- D. Congenital agammaglobulinemia
- E. Cryptosporidium
- F. None of the Above

180. Which of the following is most particularly a danger for the immunocompromised, especially HIV-positive persons and persons with AIDS?

- A. Giardia lamblia
- B. Giardiasis
- C. Malaise
- D. Cryptosporidiosis
- E. Anti-water Infection
- F. None of the Above

181. Immunosuppression severe enough can lead to chronic?

- A. Cryptosporidium parvum
- B. Giardiasis
- C. Malaise
- D. Cryptosporidiosis
- E. Anti-water Infection
- F. None of the Above

182. Which of the following organism/disease related terms was first identified as a human pathogen, diagnosis was made by a biopsy of intestinal tissue?

- A. C. parvum
- B. Cryptosporidiosis
- C. Giardiasis
- D. Congenital agammaglobulinemia
- E. Cryptosporidium
- F. None of the Above

183. Staining methods were then developed to detect and identify the oocysts directly from stool samples.

- A. True
- B. False

184. The modified acid-fast stain is traditionally used to most reliably and specifically detect the presence of?

- A. Cryptosporidium parvum
- B. Cryptosporidiosis
- C. Cryptosporidial oocysts
- D. Giardiasis
- E. Cryptosporidium
- F. None of the Above

185. According to the text, even though persons who are taking immunosuppressive drugs may develop chronic and/or severe _____, the infection usually resolves when these drugs are decreased or stopped.

- A. Cryptosporidium parvum
- B. Cryptosporidiosis
- C. AIDS
- D. Congenital agammaglobulinemia
- E. Cryptosporidium
- F. None of the Above

186. The following persons include child care workers; diaper-aged children who attend child care centers; persons exposed to human feces by sexual contact; and caregivers who might come in direct contact with feces while caring for a person infected with?

- A. Cryptosporidium parvum
- B. Cryptosporidiosis
- C. AIDS
- D. Congenital agammaglobulinemia
- E. Cryptosporidium
- F. None of the Above

187. Which term below does not utilize an insect vector and is capable of completing its life cycle within a single host, resulting in cyst stages which are excreted in feces and are capable of transmission to a new host?

- A. Cryptosporidium parvum
- B. Giardiasis
- C. Malaise
- D. Cryptosporidiosis
- E. Anti-water Infection
- F. None of the Above

Cholera Vibrio cholerae Chapter 4

Cholera Vibrio cholerae

188. Cholera is an infection of the small intestine that causes a large amount of watery diarrhea.

- A. True
- B. False

189. According to the text, Cholera is an infection in the small intestine caused by?

- A. Amoebiasis
- B. Cholera
- C. The bacterium Vibrio cholerae
- D. Rapid dehydration and electrolyte imbalance
- E. Diarrheal disease
- F. None of the Above

190. Which of the following terms is protected from the severe effects of cholera because they don't lose water as quickly?

- A. Blood types
- B. Thin people
- C. Antibacterial drugs
- D. Carriers of the cystic fibrosis gene
- E. Carriers of rabies
- F. None of the Above

191. Which of the following terms appears in a community it is essential to ensure three things: hygienic disposal of human feces, an adequate supply of safe drinking water, and good food hygiene?

- A. Cryptosporidium parvum
- B. Cryptosporidiosis
- C. Cholera
- D. El Tor
- E. Cryptosporidium
- F. None of the Above

192. Because of the severity of the diarrhea and vomiting can lead to rapid dehydration and electrolyte imbalance, and?

- A. Amoebiasis
- B. Cholera
- C. Antibacterial drugs
- D. Death
- E. Diarrheal disease
- F. None of the Above

193. To shorten its duration and severity, antibacterial drugs are beneficial in those with?

- A. Amoebiasis
- B. Cholera
- C. Severe disease
- D. Rapid dehydration and electrolyte imbalance
- E. Diarrheal disease
- F. None of the Above

194. Which of the following organism/disease related term has been very rare in industrialized nations for the last 100 years?

- A. Amoebiasis
- B. Cholera
- C. Mexicana cholera
- D. Entamoeba histolytica
- E. Cystic fibrosis gene
- F. None of the Above

195. Which of the following organism/disease related term is the most feared epidemic diarrheal disease because of its severity?

- A. Amoebiasis
- B. Vibrio cholerae
- C. Bacterial meningitis
- D. Entamoeba histolytica
- E. Cystic fibrosis
- F. None of the Above

196. Which of the following organism/disease related term is a disease of the gastrointestinal tract caused by the Vibrio cholerae bacterium and is also known as?

- A. Amoebic cholera
- B. Amoebiasis
- C. Mexicana cholera
- D. European cholera
- E. Asiatic cholera
- F. None of the Above

197. Cholera has been found in only two other animal populations: shellfish and plankton.

- A. True
- B. False

198. Which of the following terms is rarely spread directly from person to person?

- A. Cryptosporidium parvum
- B. Cryptosporidiosis
- C. Cholera
- D. El Tor
- E. Cryptosporidium
- F. None of the Above

199. Cholera has two strains, toxic and nontoxic.

- A. True
- B. False

200. Which of the following organism/disease related term was prevalent in the 1800s but has been virtually eliminated by modern sewage and water treatment systems?

- A. Amoebic cholera
- B. Cholera
- C. Mexicana cholera
- D. European cholera
- E. Asiatic cholera
- F. None of the Above

201. Genetic research has determined that a person's susceptibility to cholera and other diarrheas) is affected by their blood type.

- A. True
- B. False

202. Those with type A blood is the most susceptible.

- A. True
- B. False

203. Those with type O are the most resistant, virtually immune. Between these two extremes are the O and O negative blood types.

- A. True B. False

204. The mode of transmission of this disease by water was proven in 1849 by John Snow.

- A. Cryptosporidium parvum D. El Tor
B. Cryptosporidiosis E. Cryptosporidium
C. Cholera F. None of the Above

205. Cholera is typically transmitted by either contaminated food or water. With seafood being the usual cause, while in the developing world it is more often water.

- A. True B. False

Cholera Treatment

206. When consumed, most bacteria do not survive the?

- A. Stomach acid D. Resistance
B. Lack of nutrients E. Antibiotic treatments
C. Antibacterial drugs F. None of the Above

207. During the passage through the stomach, few surviving bacteria conserve their energy and stored nutrients by shutting down much?

- A. Life support D. Resistance
B. Protein production E. Antibiotic treatments
C. Reproduction F. None of the Above

208. Surviving Cholera Bacteria exit the stomach and reach the small intestine, they need to propel themselves through the thick mucus that lines the small intestine to get to the intestinal walls, where they can thrive.

- A. True B. False

209. *V. cholerae* bacteria start up production of the hollow cylindrical protein flagellin to make flagella, the cork-screw helical fibers they rotate to propel themselves through the mucus of the small intestine.

- A. True B. False

210. If Cholera bacteria reach the intestinal wall, they will no longer need?

- A. Lamblia D. Cyst
B. Shell E. Flagella
C. Case F. None of the Above

211. On reaching the intestinal wall, *V. cholerae* start producing the Antibiotic treatments that give the infected person a watery diarrhea.

- A. True B. False

212. This carries the multiplying new generations of *V. cholerae* bacteria out into the drinking water of the next host if even if proper sanitation measures are in place.

- A. True B. False

213. Which of the following terms can be administered for one to three days shorten the course of the disease and reduce the severity of the symptoms?

- A. Verotoxin
- B. Antibiotic treatments
- C. Antibacterial drugs
- D. Resistance
- E. Aspirin
- F. None of the Above

214. If sufficient hydration is maintained people will recover without drugs.

- A. True
- B. False

215. Which of the following terms is typically used first line, although some strains of *V. cholerae* that have shown resistance?

- A. Verotoxin
- B. Doxycycline
- C. Antibacterial drugs
- D. Resistance
- E. Aspirin
- F. None of the Above

216. Rapid diagnostic assay methods are available for the identification of?

- A. Cholera bacteria-resistant cases
- B. Multiple drug-resistant cases
- C. Antibacterial drugs
- D. Resistance
- E. Antibiotic treatments
- F. None of the Above

217. Cholera remains a pandemic in many areas of the world.

- A. True
- B. False

218. According to the text, little is known about the mechanisms behind the spread of cholera, this has not led to a full understanding of what makes cholera outbreaks happen some places and not others.

- A. True
- B. False

219. The term Cholera morbus was used to describe both nonepidemic cholera and other gastrointestinal diseases (sometimes epidemic) that resembled cholera.

- A. True
- B. False

El Tor

220. El Tor strain has a low degree of "epidemic virulence," allowing it to spread across the world as previous strains have done. First, the ratio of cases to carriers is much less than in *Giardia lamblia* due to classic biotypes (1: 30-100 for El Tor vs. 1: 2 - 4 for "classic" biotypes).

- A. True
- B. False

Legionnaires' Disease Legionella Chapter 5

221. The first discovery of bacteria was from the _____ that came in 1976 when an outbreak of pneumonia at an American Legion convention led to 29 deaths.

- A. Legionnaire's disease
- B. Legionella pneumophila
- C. Legionella bacteria
- D. Genus Legionella
- E. Legionella species
- F. None of the Above

222. The causative agent of Legionnaires' Disease, what would come to be known as *Legionella pneumophila*, was isolated and given its own genus.

- A. True
- B. False

223. Which of the terms are classified in this genus are Gram-negative bacteria that are considered intracellular parasites?

- A. Legionnaire's disease
- B. Legionella pneumophila
- C. Legionella bacteria
- D. Organisms
- E. Legionella species
- F. None of the Above

224. Which of the terms is caused most commonly by the inhalation of small droplets of water or fine aerosol containing Legionella bacteria?

- A. Legionnaire's disease
- B. Legionella pneumophila
- C. Legionella bacteria
- D. Legionella
- E. Legionella species
- F. None of the Above

225. Which of the terms are naturally found in environmental water sources such as rivers, lakes and ponds and may colonize man-made water systems?

- A. Legionnaire's disease
- B. Legionella pneumophila
- C. Legionella bacteria
- D. Legionella
- E. Legionella species
- F. None of the Above

226. Which of the terms is responsible for approximately 90% of infections?

- A. Legionnaire's disease
- B. Legionella pneumophila
- C. Legionella bacteria
- D. Legionella
- E. Legionella species
- F. None of the Above

227. Most Legionnaire's disease cases are caused by _____, serogroup

1. Legionella species are small (0.3 to 0.9 μm)

- A. Legionnaire's disease
- B. Legionella pneumophila
- C. Legionella bacteria
- D. L. pneumophila
- E. Legionella species
- F. None of the Above

Chlorine Dioxide

228. Which term provides good Giardia and virus protection but its use is limited by the restriction on the maximum residual of 0.5 mg/L ClO₂/chlorite/chlorate allowed in finished water?

- A. Dry sodium chlorite
- B. Chlorine dioxide
- C. Chlorinated byproducts
- D. Ammonia residual(s)
- E. Free and/or combined chlorine
- F. None of the Above

229. Chlorine dioxide may be used for either taste or odor control or as a?

- A. Chloramine
- B. T10 value
- C. Free chlorine
- D. Chlorine dioxide
- E. Pre-disinfectant
- F. None of the Above

Escherichia Coli Chapter 6

E-Coli Section – Some information may be in the Appendix.

230. Escherichia coli. There are several pathogenic strains of Escherichia coli, which are classified under enterovirulent E. coli.

- A. True
- B. False

231. Escherichia coli. are enterohemorrhagic, enteroinvasive, enterotoxigenic, enteropathogenic, and enteroaggregative.

- A. True
- B. False

232. Escherichia coli. In its most severe form, it can cause?

- A. Hemorrhagic colitis
- B. Escherichia coli O157:H7
- C. Beaver fever
- D. Pseudomonas
- E. Salmonellosis
- F. None of the Above

233. Prevention strategies for E. coli O157:H7 include _____, halogenation of water, or boiling water for one minute.

- A. Primary protection
- B. Source protection
- C. Sodium chlorite
- D. Eliminating snails with a molluscicide
- E. Backflow prevention
- F. None of the Above

234. What is the bacterial disease caused by the Salmonella species that causes diarrheal illness?

- A. Beaver fever
- B. Escherichia coli O157:H7
- C. Bacteria
- D. Pseudomonas
- E. Salmonellosis
- F. None of the Above

235. Prevention strategies for Salmonella include source protection, halogenation of water, and also?

- A. KNMO4
- B. Source protection
- C. Chlorine dioxide
- D. Eliminating snails with a molluscicide
- E. Boiling water for one minute
- F. None of the Above

Waterborne Pathogens and Disease Review

How Diseases Are Transmitted.

236. Waterborne pathogens are primarily spread by the?

- A. Fecal-oral, or feces-to-mouth, route
- B. Dermal to fecal route
- C. Oral to fecal route
- D. Influenza route
- E. Waterborne mishaps
- F. None of the Above

237. When infected humans or animals pass the bacteria, viruses, and _____ in their stool, pathogens may get into water and spread disease.

- A. Fecal Coliform and E coli
- B. Protozoa
- C. Macroorganisms
- D. Cryptosporidiosis
- E. Bioslime
- F. None of the Above

238. For another person to become infected, he or she must take that pathogen in through the mouth.

- A. True
- B. False

239. This term means when in nature it is different from other types of pathogens such as the viruses that cause influenza (the flu) or the bacteria that cause tuberculosis.

- A. Fecal Coliform and E coli
- B. Giardia lamblia
- C. Microorganism(s)
- D. Waterborne Pathogen(s)
- E. Coliform bacteria
- F. None of the Above

240. According to the text, _____ are spread by secretions that are coughed or sneezed into the air by an infected person.

- A. Fecal Coliform and E coli
- B. Giardia lamblia
- C. Microorganisms
- D. Influenza virus and tuberculosis bacteria
- E. Coliform bacteria
- F. None of the Above

Bacterial Diseases

241. Bacterial diseases that can be transmitted through water, Cholera, Legionellosis, salmonellosis, shigellosis, and?

- A. Shigellosis
- B. Cysts
- C. Hepatitis A
- D. Campylobacteriosis
- E. HIV
- F. None of the Above

242. Which of the following organism/disease related term polio, and viral gastroenteritis (Norwalk agent) and this one are other viral diseases that can be transmitted through water?

- A. Pathogens
- B. Bacterial diseases
- C. Aseptic meningitis
- D. Foodborne or waterborne illnesses
- E. Amebiasis
- F. None of the Above

243. According to the text, few viruses in drinking water can be inactivated by chlorine or other disinfectants.

- A. True
- B. False

244. A susceptible person must drink the water that contains the pathogen in order for illness (disease) to occur.

- A. True
- B. False

245. Which of the following organism/disease term will is the most common diarrheal illness caused by bacteria?

- A. Aseptic meningitis
- B. Campylobacteriosis
- C. Pathogens
- D. Giardia or Cryptosporidium
- E. Tuberculosis bacteria
- F. None of the Above

Amebiasis– Some information may be in the Appendix.

246. Amebiasis is an infection of the intestines caused by?

- A. Pathogens
- B. Bacterial diseases
- C. Norwalk agent
- D. Foodborne or waterborne illnesses
- E. The parasite Entamoeba histolytica
- F. None of the Above

247. Amoebiasis, or Amebiasis, refers to infection caused by?

- A. Amoebiasis
- B. Cholera
- C. Antibacterial drugs
- D. The amoeba Entamoeba histolytica
- E. Cystic fibrosis gene
- F. None of the Above

248. Which of the following organism/disease related term is usually transmitted by the fecal-oral route, but it can also be transmitted indirectly through contact with dirty hands or objects as well as by anal-oral contact?

- A. Amoebiasis
- B. Cholera
- C. Antibacterial drugs
- D. Rapid dehydration and electrolyte imbalance
- E. Diarrheal disease
- F. None of the Above

249. Any non-encysted amoebae, or _____, die quickly after leaving the body?

- A. Amoebiasis
- B. Cholera
- C. Trophozoites
- D. Electrolytes
- E. Cystic fibrosis gene
- F. None of the Above

250. Which of the following organism/disease term that may or may not be symptomatic and can remain latent in an infected person for several years?

- A. Gastrointestinal infection
- B. Cholera
- C. Antibacterial drugs
- D. Rapid dehydration and electrolyte imbalance
- E. Diarrheal disease
- F. None of the Above

251. Which of the following organism/disease term can live in the large intestine (colon) without causing disease?

- A. Amoebiasis
- B. Cholera
- C. Antibacterial drugs
- D. Entamoeba histolytica
- E. Cystic fibrosis gene
- F. None of the Above

Hepatitis Section

252. Which of the following hepatitis types affects only those who also have hepatitis B, and hepatitis E is extremely rare in the United States?

- A. Type B
- B. Type A
- C. Type C
- D. Type D
- E. Type E hepatitis
- F. None of the Above

253. Which of the following hepatitis can be passed through contact with infected blood, contaminated needles, or by sexual contact with an HIV-infected person?

- A. Type A hepatitis
- B. Type B hepatitis
- C. Type C hepatitis
- D. Type D hepatitis
- E. Type E hepatitis
- F. None of the Above

254. Which of the following hepatitis is most likely to be transmitted in feces, through oral contact, or in water that's been contaminated?

- A. Type B hepatitis
- B. Type A hepatitis
- C. Type C hepatitis
- D. Type D hepatitis
- E. Type E hepatitis
- F. None of the Above

255. Which of the following hepatitis is contracted through anal-oral contact, by coming in contact with the feces of someone with it, or by eating or drinking hepatitis contaminated food or water?

- A. Type A hepatitis
- B. Type B hepatitis
- C. Type C hepatitis
- D. Type D hepatitis
- E. Type E hepatitis
- F. None of the Above

256. Which of the following hepatitis can be contracted from infected blood, seminal fluid, vaginal secretions, or contaminated drug needles, including tattoo or body-piercing equipment.

- A. Type A hepatitis
- B. Type B hepatitis
- C. Type C hepatitis
- D. Type D hepatitis
- E. Type E hepatitis
- F. None of the Above

257. Which of the following hepatitis is not easily spread through sex?

- A. Type B hepatitis
- B. Type A hepatitis
- C. Type C hepatitis
- D. Type D hepatitis
- E. Type E hepatitis
- F. None of the Above

Shigella dysenteriae– Some information may be in the Appendix.

258. Some strains produce enterotoxin and Shiga toxin, similar to the verotoxin of *E. coli* O157:H7. Both Shiga toxin and verotoxin are associated with causing hemolytic uremic syndrome.

- A. True
- B. False

259. Which term invades the host through epithelial cells of the large intestine?

- A. Bacillary dysentery
- B. Shigellae
- C. *S. dysenteriae*
- D. Shigella
- E. Verotoxin
- F. None of the Above

260. Which term are diarrhea, fever, nausea, vomiting, stomach cramps, and straining to have a bowel movement?

- A. Bacillary dysentery
- B. Shigellae
- C. *S. dysenteriae*
- D. Shigella infection
- E. Verotoxin
- F. None of the Above

261. *Shigella dysenteriae* is a species of the ball-shaped bacterial genus *Shigella*.

- A. True
- B. False

262. Which term can cause shigellosis (bacillary dysentery)?

- A. Bacillary dysentery
- B. Shigella
- C. *S. dysenteriae*
- D. Infection
- E. Verotoxin
- F. None of the Above

263. Which term are Gram-negative, non-spore-forming, facultatively anaerobic, non-motile bacteria?

- A. Bacillary dysentery
- B. Shigellae
- C. *S. dysenteriae*
- D. Shigella
- E. Verotoxin
- F. None of the Above

264. According to the text, *S. dysenteriae*, spread by contaminated water and food, causes the most severe dysentery because of its potent and deadly _____, but other species may also be dysentery agents.

- A. Bacillary dysentery
- B. Shigellae
- C. *S. dysenteriae*
- D. Shiga toxin
- E. Verotoxin
- F. None of the Above

265. Which term is typically via ingestion (fecal–oral contamination); depending on age and condition of the host as few as ten bacterial cells can be enough to cause an infection?

- A. Bacillary dysentery
- B. Shigellae
- C. *S. dysenteriae*
- D. Shigella infection
- E. Verotoxin
- F. None of the Above

266. Which term causes dysentery that result in the destruction of the epithelial cells of the intestinal mucosa in the cecum and rectum?

- A. Bacillary dysentery
- B. Shigellae
- C. *S. dysenteriae*
- D. Shigella
- E. Verotoxin
- F. None of the Above

267. Which term usually last for several days, but can last for weeks. Shigella is implicated as one of the pathogenic causes of reactive arthritis worldwide?

- A. Bacillary dysentery
- B. Shigellae
- C. Symptoms
- D. Shigella infection
- E. Verotoxin
- F. None of the Above

Shigellosis

268. Which term is an infectious disease caused by a group of bacteria called Shigella?

- A. Typhoid fever
- B. Gastric fever
- C. Shigellosis
- D. Gram-negative short bacillus
- E. A positive reaction
- F. None of the Above

269. Those who are infected with Shigella develop diarrhea, fever, and stomach cramps starting a week or two after they are exposed to the bacteria. The diarrhea is often watery.

- A. True
- B. False

270. Which term usually resolves in 5 to 7 days?

- A. Typhoid fever
- B. Gastric fever
- C. Shigellosis
- D. Gram-negative short bacillus
- E. A positive reaction
- F. None of the Above

271. Persons with shigellosis in the United States often require hospitalization.

- A. True
- B. False

272. According to the text, some persons who are infected may have no symptoms at all, but may still pass the _____ to others.

- A. Typhoid fever
- B. Gastric fever
- C. Shigellosis
- D. Gram-negative short bacillus
- E. Shigella bacteria
- F. None of the Above

273. Which term is an acute bacterial infection of the lining of the intestines?

- A. Typhoid fever
- B. Gastric fever
- C. Shigellosis
- D. Gram-negative short bacillus
- E. A positive reaction
- F. None of the Above

Typhoid

274. Typhoid fever, also known as Typhoid, is a common worldwide bacterial disease, transmitted by the ingestion of food or water contaminated with the feces of an infected person, which contain the bacterium *Salmonella typhi*, Serovar Typhi.

- A. True
- B. False

275. *Salmonella typhi* is a Gram-negative short bacillus that is motile due to its peritrichous flagella.

- A. True
- B. False

276. Salmonella typhi grows best at 37°C / 98.6°F – human body temperature.

- A. True B. False

277. This fever received various names, such as gastric fever, _____, infantile remittent fever, slow fever, nervous fever, pythogenic fever, etc.

- A. Typhoid fever D. Gram-negative short bacillus
B. Gastric fever E. A positive reaction
C. Abdominal typhus F. None of the Above

278. Typhoid fever is unrelated to?

- A. Typhoid flu D. Typhus
B. Gastric fever E. Typhoid hurricane
C. Shigellosis F. None of the Above

279. Which term is divided into 4 individual stages, each lasting approximately 1 week. In the 1st week, the temperature rises slowly and fever fluctuations are seen with relative bradycardia, malaise, headache, and cough?

- A. Typhoid fever D. Gram-negative short bacillus
B. Gastric fever E. A positive reaction
C. Shigellosis F. None of the Above

280. According to the text, there is leukopenia, with eosinopenia and relative lymphocytosis, a positive reaction and blood cultures are positive for?

- A. Typhoid fever D. Salmonella typhi or paratyphi
B. Gastric fever E. A positive reaction
C. Shigellosis F. None of the Above

How is typhoid fever spread?

281. Salmonella Typhi lives only in humans. Persons with typhoid fever carry the bacteria in their bloodstream and intestinal tract.

- A. True B. False

282. Typhoid fever is spread through food or drink beverages that have been handled by a person who is shedding _____ or if sewage contaminated with Salmonella Typhi bacteria gets into the water you use for drinking or washing food.

- A. Typhoid bugs D. Salmonella Typhi
B. Gastric fever E. A positive reaction
C. Shigellosis F. None of the Above

283. Which term when eaten or drunk, they multiply and spread into the bloodstream, the body reacts with fever and other signs and symptoms?

- A. Typhoid fever D. Gram-negative short bacillus
B. Gastric fever E. Salmonella Typhi
C. Shigellosis F. None of the Above

**EPA Regulations Chapter 8
Disinfection Rule Review**

284. Chlorine is the most widely used water disinfectant due to its effectiveness and cost. Using chlorine as a drinking water disinfectant has prevented millions of water borne diseases, such as typhoid, cholera, dysentery, and diarrhea. Most states require community water systems to use chlorination.

- A. True B. False

285. These compounds are called disinfection by-products (DBPs). All disinfectants form DBPs in one of two reactions: Chlorine and chlorine-based compounds (halogens) react with organics in water causing the chlorine atom to substitute other atoms resulting in?

- A. Chlorine D. Halogenated by-products
B. Organic sulfide(s) E. HOCl
C. Calcium carbonate F. None of the Above

286. Oxidation reactions, where chlorine oxidizes _____ present in water. Secondary by-products are also formed when multiple disinfectants are used.

- A. Carbon D. Chlorine and chlorine-based compounds (halogens)
B. Surface water E. Secondary by-products
C. Compounds F. None of the Above

287. Which of the following terms requires systems using public water supplies from either surface water or groundwater under the direct influence of surface water to disinfect?

- A. TTHM and HAA5 Rule D. Disinfection byproducts (DBPs) Rule
B. DBP MCLs Rule E. Surface Water Treatment Rule (SWTR)
C. A community water system (CWS) F. None of the Above

288. Since some disinfectants produce chemical by-products, the dual objective of disinfection is to provide the required level of organism destruction and remain within the maximum contaminant level (MCL) for the SWTR disinfection set by EPA.

- A. True B. False

289. At this time, an MCL is set for only _____, and proposed for additional disinfection byproducts.

- A. TTHM and HAA5 Rule D. Disinfection byproducts (DBPs) Rule
B. DBP MCLs Rule E. Total Trihalomethanes
C. A community water system (CWS) F. None of the Above

290. Which of the following rules apply to all community and non-community water systems using a disinfectant such as chlorine, chloramines, ozone and chlorine dioxide?

- A. TTHM and HAA5 Rule D. Disinfection byproducts (DBPs) Rule
B. DBP MCLs Rule E. Disinfectants and Disinfection Byproducts (DBP)
C. A community water system F. None of the Above

291. The Long Term 2 Enhanced Surface Water Treatment Rule (LT2) rule applies to all water systems using _____ under the influence of a surface water, as well as groundwater/surface water blends.

- A. Surface water, groundwater
- B. DBP MCLs Rule
- C. A community water system (CWS)
- D. Disinfection byproducts (DBPs) Rule
- E. Total Trihalomethanes
- F. None of the Above

Public Health Concerns

292. While disinfectants are effective in controlling many microorganisms, they react with natural organic and inorganic matter in source water and distribution systems to form?

- A. DBPs
- B. Chlorine and chloramine
- C. Stage 2 DBPR
- D. Classes of DBPs
- E. Ultraviolet light
- F. None of the Above

293. Which term is used to express (e.g., chlorite, bromodichloromethane, and certain haloacetic acids) have also been shown to cause adverse reproductive or developmental effects in laboratory animals?

- A. DBPs
- B. Chlorine and chloramine
- C. Stage 2 DBPR
- D. Classes of DBPs
- E. Ultraviolet light
- F. None of the Above

294. Several epidemiology studies have suggested a weak association between certain cancers or reproductive and developmental effects, and exposure to chlorinated surface water.

- A. True
- B. False

295. More than 200 million people consume water that has been disinfected. Because of the large population exposed, health risks associated with _____, even if small, need to be taken seriously.

- A. DBPs
- B. Chlorine and chloramine
- C. Stage 2 DBPR
- D. Classes of DBPs
- E. Ultraviolet light
- F. None of the Above

296. Which Rule and Disinfection Byproduct Rule updates and supersedes the 1979 regulations for total trihalomethanes? In addition, it will reduce exposure to three disinfectants and many disinfection byproducts.

- A. DBPs
- B. The Stage 1 Disinfectant
- C. SDWA in 1996
- D. Stage 3 Disinfectant and Disinfection Byproduct
- E. The LT2 requirements
- F. None of the Above

Stage 2 DBP Rule Federal Register Notices

297. Which Rule is one part of the Microbial and Disinfection Byproducts Rules (MDBPs), which are a set of interrelated regulations that address risks from microbial pathogens and disinfectants/disinfection byproducts?

- A. Groundwater Rule
- B. Compliance
- C. The Stage 2 DBP
- D. Long Term 2 Enhanced Surface Water Treatment
- E. Interim Enhanced Surface Water Treatment
- F. None of the Above

298. Which Rule focuses on public health protection by limiting exposure to DBPs, specifically total trihalomethanes (TTHM) and five haloacetic acids (HAA5), which can form in water through disinfectants used to control microbial pathogens?

- A. Stage 2 DBPR
- B. DBP exposure
- C. The Stage 2 DBP
- D. Long Term 2 Enhanced Surface Water Treatment
- E. Traditional disinfection practices
- F. None of the Above

299. This rule will apply to all community water systems and nontransient non-community water systems that add a primary or residual disinfectant other than _____ or deliver water that has been disinfected by a primary or residual disinfectant other than UV.

- A. Ultraviolet (UV) light
- B. The open-channel system
- C. UV rather than ozone
- D. UV source
- E. UV radiation
- F. None of the Above

300. Which of the following rules has been highly effective in protecting public health and has also evolved to respond to new and emerging threats to safe drinking water?

- A. Stage 2 DBPR
- B. DBP exposure
- C. The Stage 2 DBP rule
- D. Long Term 2 Enhanced Surface Water Treatment Rule
- E. Safe Drinking Water Act (SDWA)
- F. None of the Above

301. There are specific microbial pathogens, such as _____, which can cause illness, and are highly resistant to traditional disinfection practices.

- A. Enteric virus(es)
- B. Oocyst(s)
- C. Cryptosporidium
- D. C. perfringens
- E. E. coli host culture
- F. None of the Above

302. Amendments to the SDWA in 1996 require EPA to develop rules to balance the risks between microbial pathogens and disinfection byproducts (DBPs).

- A. True
- B. False

303. The Stage 1 Disinfectants and Disinfection Byproducts Rule and _____, promulgated in December 1998, were the first phase in a rulemaking strategy required by Congress as part of the 1996 Amendments to the Safe Drinking Water Act.

- A. Major health advances
- B. The Stage 2 DBPR
- C. This final rule
- D. Amendments to the SDWA in 1996
- E. Interim Enhanced Surface Water Treatment Rule
- F. None of the Above

304. The Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) builds upon the _____ to address higher risk public water systems for protection measures beyond those required for existing regulations.

- A. Stage 2 DBPR
- B. DBP exposure
- C. Stage 1 DBPR
- D. Long Term 2 Enhanced Surface Water Treatment Rule
- E. Traditional disinfection practices
- F. None of the Above

305. Which Rule and the Long Term 2 Enhanced Surface Water Treatment Rule are the second phase of rules required by Congress?

- A. Major public health advances
- B. The Stage 2 DBPR
- C. This final rule
- D. Amendments to the SDWA in 1996
- E. Primary or residual disinfectant
- F. None of the Above

306. Which Rule will reduce potential cancer and reproductive and developmental health risks from disinfection byproducts (DBPs) in drinking water, which form when disinfectants are used to control microbial pathogens?

- A. Stage 3 DBPR
- B. DBP exposure
- C. Stage 2 Disinfection Byproducts
- D. Long Term 2 Enhanced Surface Water
- E. Traditional disinfection practices
- F. None of the Above

307. Which Rule strengthens public health protection for customers by tightening compliance monitoring requirements for two groups of DBPs, trihalomethanes (TTHM) and haloacetic acids (HAA5)?

- A. Major public health advances
- B. The Stage 3 DBPR
- C. Stage 2 Disinfection Byproducts
- D. Amendments to the SDWA in 1996
- E. Primary or residual disinfectant
- F. None of the Above

308. Which Rule targets systems with the greatest risk and builds incrementally on existing rules. This regulation will reduce DBP exposure and related potential health risks and provide more equitable public health protection?

- A. Stage 3 DBPR
- B. Stage 2 DBPR
- C. The Stage 1 DBP rule
- D. Long Term 2 Enhanced Surface Water Treatment Rule
- E. Stage 4 DBPR
- F. None of the Above

309. Which Rule is being promulgated simultaneously with the Long Term 2 Enhanced Surface Water Treatment Rule to address concerns about risk tradeoffs between pathogens and DBPs?

- A. Major public health advances
- B. The Stage 2 DBPR
- C. This final rule
- D. Amendments to the SDWA in 1996
- E. Primary or residual disinfectant
- F. None of the Above

What does the rule require?

310. Under which Rule, systems will conduct an evaluation of their distribution systems, known as an Initial Distribution System Evaluation (IDSE), to identify the locations with high disinfection byproduct concentrations?

- A. Stage 2 DBPR
- B. DBP exposure
- C. The Stage 1 DBP rule
- D. Long Term 2 Enhanced Surface Water Treatment Rule
- E. Traditional disinfection practices
- F. None of the Above

311. Compliance with the maximum contaminant levels for two groups of disinfection byproducts (TTHM and HAA5), referred to as the?

- A. TTHM and HAA5
- B. DBP MCLs
- C. Locational running annual average (LRAA)
- D. Disinfection byproducts (DBPs)
- E. Trihalomethanes and haloacetic acids
- F. None of the Above

312. Which Rule also requires each system to determine if they have exceeded an operational evaluation level, which is identified using their compliance monitoring results?

- A. Stage 2 DBPR
- B. DBP exposure
- C. The Stage 1 DBP rule
- D. Long Term 2 Enhanced Surface Water Treatment Rule
- E. Traditional disinfection practices
- F. None of the Above

313. A system that exceeds an operational evaluation level is required to review their operational practices and submit a report to their state that identifies actions that may be taken to mitigate future high?
- A. TTHM5 and HTAA5
 - B. Halos
 - C. DBP levels
 - D. UV
 - E. Amounts of rainfall
 - F. None of the Above

Who must comply with the rule?

314. Entities potentially regulated by the _____ are community and nontransient noncommunity water systems that produce and/or deliver water that is treated with a primary or residual disinfectant other than ultraviolet light.
- A. DBPs from chlorination
 - B. Chlorine and chloramine
 - C. Stage 2 DBPR
 - D. Classes of DBPs
 - E. TTHM and HAA5
 - F. None of the Above

315. Which system is a public water system that serves year-round residents of a community, subdivision, or mobile home park that has at least 15 service connections or an average of at least 25 residents.
- A. NTNCWS
 - B. A non-community water system
 - C. A community water system (CWS)
 - D. Trailer park
 - E. A nontransient water system
 - F. None of the Above

316. Which system is a water system that serves at least 25 of the same people more than six months of the year, but not as primary residence, such as schools, businesses, and day care facilities?
- A. Trailer park
 - B. A non-community water system
 - C. A community water system (CWS)
 - D. A nontransient non-community water system (NTNCWS)
 - E. A nontransient water system
 - F. None of the Above

What are Disinfection Byproducts (DBPs)?

317. Which term forms when disinfectants used to treat drinking water react with naturally occurring materials in the water (e.g., decomposing plant material)?
- A. Disinfectants
 - B. DBLs
 - C. Humic
 - D. Disinfection byproducts (DBPs)
 - E. Sodium Thiosulfate
 - F. None of the Above

318. Total trihalomethanes (TTHM - chloroform, bromoform, bromodichloromethane, and dibromochloromethane) and haloacetic acids (HAA5 - monochloro-, dichloro-, trichloro-, monobromo-, dibromo-) are widely occurring _____ formed during disinfection with chlorine and chloramine.
- A. Sodium Thiosulfate
 - B. Chlorine and chloramine
 - C. Stage 2 DBPR
 - D. Classes of DBPs
 - E. Trihalomethanes and haloacetic acids
 - F. None of the Above

319. Which term in drinking water can change from day to day, depending on the season, water temperature, amount of disinfectant added, the amount of plant material in the water, and a variety of other factors?
- A. Thiols
 - B. Chlorine and chloramine
 - C. Stage 2 DBPR
 - D. Classes of DBPs
 - E. Trihalomethanes and haloacetic acids
 - F. None of the Above

Are THMs and HAAs the only disinfection byproducts?

320. The presence of this term is representative of the occurrence of many other chlorination DBPs; thus, a reduction in these generally indicates a reduction of DBPs from chlorination.

- A. DBPs from chlorination
- B. Chlorine and chloramine
- C. Stage 2 DBPR
- D. Classes of DBPs
- E. TTHM and HAA5
- F. None of the Above

Stage 2 DBP Rule Federal Register Notices

321. Chlorine and its _____ are neutrally charged and therefore easily penetrate the negatively charged surface of pathogens.

- A. Halogen
- B. Water chlorination
- C. Chlorine as a disinfectant
- D. Hydrolysis product hypochlorous acid
- E. Hypochlorous acid
- F. None of the Above

322. There are specific microbial pathogens, such as _____, which can cause illness and is resistant to traditional disinfection practices.

- A. Cryptosporidium
- B. Sodium hypochlorite
- C. Bromoform
- D. Emerging threats to safe drinking water
- E. Hypochlorous acid (HOCl), and hydrochloric acid (HCl)
- F. None of the Above

Water Sampling and Laboratory Procedures Chapter 9

Arsenic

323. Long-term exposure of this compound/element/substance in drinking water to a variety of cancers in humans.

- A. Arsenic
- B. Copper
- C. Basalt
- D. THHMMS
- E. Silica
- F. None of the Above

324. The EPA set a standard limit on the amount of compound/element/substance in drinking water to 10 ppb.

- A. Arsenic
- B. Trihalomethanes
- C. Disinfection
- D. Copper
- E. Disinfection byproducts (DBPs)
- F. None of the Above

325. This compound/element/substance is a chemical that occurs naturally in the earth's crust. When rocks, minerals, and soil erode, they release this compound/ element/ substance into water supplies.

- A. Arsenic
- B. Trihalomethanes
- C. Disinfection byproducts
- D. Basalt
- E. Granite
- F. None of the Above

ICR

326. The EPA has collected data required by the Information Collection Rule (ICR) to support future regulation of Microbial contaminants, disinfectants, and disinfection byproducts.

- A. True
- B. False

327. The rule is intended to provide EPA with information on chemical byproducts that form when disinfectants used for microbial control react with chemicals already present in source water Disease-causing microorganisms, including Cryptosporidium; and engineering data to control these contaminants.

- A. True B. False

Disinfection Byproduct Regulations

328. Which compound/element/substance are a group of chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants are used?

- A. Disinfectant residual D. Giardia and viruses
B. Chlorite E. Disinfection By-Products (DBPs)
C. Haloacetic Acids (HAA5) F. None of the Above

329. Which compound/element/substance is a chemical that is formed when ozone, used to disinfect drinking water, reacts with naturally occurring bromide found in source water?

- A. Bromate D. From the results of coliform testing
B. Counter pathogens E. Bacteria, Virus and Intestinal parasites
C. Monobromoacetic acid F. None of the Above

330. Trihalomethanes are regulated at a maximum allowable annual average level of 100 ppb for water systems serving more than 10,000 people under which of the following rules?

- A. Cryptosporidium D. Total Trihalomethane
B. Trihalomethanes E. Stage 1 Disinfectant/Disinfection Byproduct
C. Disinfection byproduct F. None of the Above

331. Which rule standard became effective for trihalomethanes and other disinfection byproducts in December 2001 for large surface water public water systems?

- A. Cryptosporidium D. Total Trihalomethane
B. Trihalomethanes E. Stage 1 Disinfectant/Disinfection Byproduct
C. Disinfection byproduct F. None of the Above

332. Which compound/element/substance are formed when disinfectants used in water treatment plants react with bromide and/or natural organic matter (i.e., decaying vegetation) present in the source water?

- A. Cryptosporidium D. Total Trihalomethane
B. Trihalomethanes E. Disinfection byproducts (DBPs)
C. Chlorine byproduct F. None of the Above

333. According to the text, different disinfectants produce different types or amounts of?

- A. Cryptosporidium D. Total Trihalomethane
B. Trihalomethanes E. Disinfection byproducts (DBPs)
C. Chlorine byproduct F. None of the Above

334. Which rule standards have been established have been identified in drinking water, including trihalomethanes, haloacetic acids, bromate, and chlorite?

- A. Cryptosporidium Rule D. Total Trihalomethane Rule
B. Trihalomethanes Rule E. Disinfection byproducts (DBPs)
C. Acceptable standard F. None of the Above

335. Which compound/element/substance are chloroform, bromodichloromethane, dibromochloromethane, and bromoform?

- A. Cryptosporidium
- B. Trihalomethanes
- C. HAAs
- D. Total HAA5s
- E. Maximum Contaminant Levels MCLs
- F. None of the Above

Microbial Regulations

336. One of the key regulations developed and implemented by the United States Environmental Protection Agency to counter pathogens in drinking water is the Surface Water Treatment Rule requires that a public water system, using surface water as its source, have sufficient treatment to reduce the source water concentration of Giardia and viruses by at least 99.9% and 99.99%, respectively.

- A. True
- B. False

337. Which rule specifies treatment criteria to assure that these performance requirements are met; they include turbidity limits, disinfectant residual, and disinfectant contact time conditions?

- A. Long Term 1 Rule
- B. Maximum Contaminant Level Goal (MCLG)
- C. Stage 1 Byproducts Rule
- D. Surface Water Treatment Rule
- E. Interim Enhanced Surface Water
- F. None of the Above

338. Which rule was established to maintain control of pathogens while systems lower disinfection byproduct levels to comply with the Stage 1 Disinfectants/Disinfection Byproducts Rule and to control Cryptosporidium?

- A. Long Term 1 Enhanced Surface Water Treatment Rule
- B. Maximum Contaminant Level Goal (MCLG)
- C. Stage 1 Disinfectants/Disinfection Byproducts Rule
- D. Surface Water Treatment Rule
- E. Interim Enhanced Surface Water Treatment Rule
- F. None of the Above

339. The EPA established a MCL of 0.0010 for all public water systems and a 99% removal requirement for Cryptosporidium in filtered public water systems that serve at least 100,000 people. The new rule will tighten turbidity standards by December 2001.

- A. True
- B. False

340. Color is an indicator of the physical removal of particulates, including pathogens.

- A. True
- B. False

Bacteriological Monitoring Section

341. Which of the following are usually harmless, occur in high densities in their natural environment and are easily cultured in relatively simple bacteriological media?

- A. Indicator bacteria
- B. Bacteria tests
- C. Contaminate
- D. Microbiological analysis
- E. Presence of an indicator
- F. None of the Above

342. Indicators in common use today for routine monitoring of drinking water include total coliforms, fecal coliforms, and _____.

- A. Sample container
- B. Bacteria tests
- C. Coliform bacteria
- D. Escherichia coli (E. coli)
- E. Iron bacteria
- F. None of the Above

343. According to the text, the routine microbiological analysis of your water is for?
A. Indicator bacteria D. Coliform bacteria
B. Bacteria tests E. Presence of an indicator
C. Contamination F. None of the Above

344. Which of the following terms is used as an indicator organism to determine the biological quality of your water?
A. Microbiological analysis D. Escherichia coli (E. coli)
B. Bac-T E. Presence of an indicator
C. Coliform bacteria F. None of the Above

345. The presence of an indicator or _____ in your drinking water is an important health concern.
A. Indicator bacteria D. Microbiological analysis
B. Pathogenic bacteria E. Presence of an indicator
C. Contaminate F. None of the Above

346. Which of the following terms is used to signal possible fecal contamination, and therefore, the potential presence of pathogens?
A. Indicator bacteria D. Microbiological analysis
B. Pathogenic bacteria E. Presence of an indicator
C. Contaminate F. None of the Above

Bacteria Sampling

347. Water samples for this process must always be collected in a sterile container.
A. Indicators D. pH analysis
B. Bacteria tests E. Presence of an indicator
C. Contamination F. None of the Above

348. Refrigerate the sample and transport it to the testing laboratory within eight hours (in an ice chest). Many labs will accept bacteria samples on Friday. Mailing Indicator bacteria is not recommended because laboratory analysis results are not as reliable.
A. True B. False

349. Which bug forms an obvious slime on the inside of pipes and fixtures. A water test is not needed for identification. Check for a reddish-brown slime inside a toilet tank or where water stands for several days.
A. Colonies D. Escherichia coli (E. coli)
B. Algae E. Iron bacteria
C. Coliform bacteria F. None of the Above

350. Which of the following are common in the environment and are generally not harmful, but the presence of these bacteria in drinking water is usually a result of a problem with the treatment system or the pipes which distribute water, and indicates that the water may be contaminated with germs that can cause disease.
A. Diseases D. Escherichia coli (E. coli)
B. Germs E. Iron bacteria
C. Coliform bacteria F. None of the Above

Laboratory Procedures

351. The laboratory may perform the _____ in one of four methods approved by the U.S. EPA and your local environmental or health division.

- A. Colilert
- B. Coliform
- C. Sample time
- D. Total coliform analysis
- E. Pathogen test
- F. None of the Above

Methods

352. The MMO-MUG test, a product marketed as _____, is the most common. The sample results will be reported by the laboratories as simply coliforms present or absent.

- A. Colilert
- B. Coliform
- C. Sample stuff
- D. Total coliform analysis
- E. Pathogen media
- F. None of the Above

353. If coliforms are present, the laboratory will analyze the sample further to determine if these are _____ and _____ and report their presence or absence.

- A. Colilert, E. coli
- B. Coliforms, E. coli
- C. Fecal coliforms, E. coli
- D. Total coliform analysis, Pathogens
- E. Pathogens, Total coliform analysis
- F. None of the Above

Types of Water Samples

354. It is important to properly identify the type of _____ you are collecting.

- A. Colilert
- B. Coliforms
- C. Sample
- D. Total coliform analysis
- E. Pathogens
- F. None of the Above

The three (3) types of samples are:

355. Samples collected following a coliform present' routine sample. The number of repeat samples to be collected is based on the number of _____ samples you normally collect.

- A. Repeat
- B. Special
- C. QA QC
- D. Total coliform analysis
- E. Routine
- F. None of the Above

356. What type of samples can be collected for other reasons? Examples would be a sample collected after repairs to the system.

- A. Repeat
- B. Special
- C. Sample
- D. Total coliform analysis
- E. Routine
- F. None of the Above

357. What type of samples can be collected on a routine basis to monitor for contamination? Collection should be in accordance with an approved sampling plan.

- A. Repeat
- B. Special
- C. Sample
- D. Total coliform analysis
- E. Routine
- F. None of the Above

Repeat Sampling

358. If a _____ is total coliform or fecal coliform present, a set of repeat samples must be collected within 24 hours after being notified by the laboratory.

- A. MCL compliance
- B. Distribution system
- C. Routine sample
- D. Original sampling location
- E. Repeat sample(s)
- F. None of the Above

The follow-up for repeat sampling is:

359. If only one _____ per month or quarter is required, four (4) repeat samples must be collected.

- A. Special Sample
- B. Routine sample
- C. Repeat sample(s)
- D. Coliform present
- E. Original sampling location
- F. None of the Above

360. For systems collecting two (2) or more routine samples per month, three (3) _____ must be collected.

- A. Compliance sample
- B. Distribution sample
- C. Routine sample
- D. QA/QC Split
- E. Repeat sample(s)
- F. None of the Above

361. Repeat samples must be collected from: Within five (5) service connections upstream from the?

- A. MCL compliance
- B. Distribution system
- C. Routine sample
- D. Original sampling location
- E. Repeat sample(s)
- F. None of the Above

362. Repeat samples must be collected from: Within five (5) service connections downstream from the?

- A. Special Sample
- B. Routine sample
- C. Repeat sample(s)
- D. Coliform present
- E. Original sampling location
- F. None of the Above

363. Repeat samples must be collected from: If the system has only one service connection, the _____ must be collected from the same sampling location over a four-day period or on the same day.

- A. Special Sample
- B. Routine sample
- C. Repeat sample(s)
- D. Coliform present
- E. Original sampling location
- F. None of the Above

364. Repeat samples must be collected from: All _____ are included in the MCL compliance calculation.

- A. Special Sample
- B. Routine sample
- C. Repeat sample(s)
- D. Coliform present
- E. Original sampling location
- F. None of the Above

Sampling Procedures

365. This must be followed and all operating staff must be clear on how to follow the sampling plan.

- A. Seal individual samples
- B. Chain of custody
- C. Distribution system
- D. Sample siting plan
- E. Positive for total coliform
- F. None of the Above

366. Staff must be aware of how often sampling must be done, the _____ to be used for collecting the samples.

- A. Multiple sources
- B. Sample siting plan
- C. Total coliform
- D. Proper procedures and sampling containers
- E. Sampling containers
- F. None of the Above

367. According to the text, proper procedures must be followed for repeat sampling whenever a routine sample result is?

- A. Seal individual samples
- B. Chain of custody
- C. Distribution system
- D. Sample siting plan
- E. Positive for total coliform
- F. None of the Above

Chain of Custody Procedures

368. If you have physical possession of a sample, have it in view, or have physically secured it to prevent tampering then it is defined as being in "custody."

- A. True
- B. False

369. Which of the following terms begins when the sample containers are obtained from the laboratory?

- A. Multiple sources
- B. Sample siting plan
- C. Total coliform
- D. Chain of custody record
- E. Sampling containers
- F. None of the Above

370. Each custody sample requires a _____ record and may require a seal. If you do not seal individual samples, then seal the containers in which the samples are shipped.

- A. Seal individual samples
- B. Chain of custody
- C. Distribution system
- D. Sample siting plan
- E. Positive for total coliform
- F. None of the Above

371. The sample is physical evidence, _____ procedures are used to maintain and document sample possession from the time the sample is collected until it is introduced as evidence.

- A. Multiple sources
- B. Sample siting plan
- C. Total coliform
- D. TCR
- E. Chain of custody
- F. None of the Above

372. If both parties involved in the transfer must sign, date and note the time on the chain of custody record, this is known as?

- A. Multiple sources
- B. Sample siting plan
- C. Total coliform
- D. Samples transfer possession
- E. Sampling containers
- F. None of the Above

373. The recipient will then attach the _____ showing the transfer dates and times to the custody sheets.

- A. Seal individual samples
- B. Chain of custody
- C. Shipping invoices
- D. Sample siting plan
- E. Positive for total coliform
- F. None of the Above

374. If the samples are delivered to after-hours night drop-off boxes, the custody record should note such _____ and be locked with the sealed samples inside sealed boxes.

- A. Multiple sources
- B. Sample siting plan
- C. Total coliform
- D. TCR
- E. A transfer
- F. None of the Above

Heterotrophic Plate Count HPC

375. Heterotrophic Plate Count (HPC) --- formerly known as the Standard plate count, is a procedure for estimating the number of live heterotrophic bacteria and measuring changes during water treatment and distribution in water or in swimming pools.

- A. True
- B. False

376. Colonies may arise from pairs, chains, clusters, or single cells, all of which are included in the term?

- A. Coliform bacteria units
- B. MCLs units
- C. Standards
- D. HPC units
- E. Colony-forming units
- F. None of the Above

Spread Plate Method

377. During this method, colonies are on the _____ where they can be distinguished readily from particles and bubbles.

- A. Agar surface
- B. Surface growth area
- C. Top
- D. Bottom
- E. Material
- F. None of the Above

378. According to the text, during the Spread Plate Method, colonies can be transferred quickly, and _____ easily can be discerned and compared to published descriptions.

- A. Colonies grow
- B. Surface growth
- C. Low counts
- D. Heterotrophic organisms will grow
- E. Colony morphology
- F. None of the Above

Membrane Filter Method

379. This method permits testing large volumes of _____ and is the method of choice for low-count waters.

- A. Colonies
- B. Surface water
- C. Low-turbidity water
- D. Heterotrophic organisms
- E. MCL
- F. None of the Above

Heterotrophic Plate Count (Spread Plate Method)

380. Which term uses inorganic carbon sources as their carbon source (food or substrate)?

- A. Colonies
- B. Surface growth
- C. AGAR
- D. Heterotrophic organisms
- E. Autotrophic organisms
- F. None of the Above

381. Which term provides a technique to quantify the bacteriological activity of a sample?

- A. Colonies
- B. Heat
- C. Agar
- D. Heterotrophic Plate Count
- E. MCL
- F. None of the Above

382. The R2A agar provides a medium that will support a large variety of?

- A. Colonies
- B. Bugs
- C. Germs
- D. Heterotrophic bacteria
- E. MCL
- F. None of the Above

Total Coliforms

383. According to the text, The MCL is based on the presence of total coliforms, and compliance is on a daily or weekly basis, depending on your water system type and state rule.

- A. True
- B. False

384. According to the text, for systems which collect fewer than _____ samples per month.

- A. 5
- B. 10
- C. 100
- D. 200
- E. 40
- F. None of the Above

385. For systems which collect _____ or more samples per month, no more than five (5) percent may be Positive.

- A. 5
- B. 10
- C. 100
- D. 200
- E. 40
- F. None of the Above

Acute Risk to Health (Fecal coliforms and E. coli)

386. A routine analysis shows total coliform present and is followed by a repeat analysis which indicates?

- A. Routine analysis
- B. Drinking violation
- C. Water penalty
- D. Human health violation
- E. Fecal coliform or E. coli present
- F. None of the Above

387. A routine analysis shows _____ is followed by a repeat analysis which indicates total coliform present.

- A. Routine analysis
- B. Drinking water violation
- C. MCL violation
- D. Presence
- E. Total and Fecal coliform or E. coli present
- F. None of the Above

388. Which of the following terms requires the water system to provide public notice via radio and television stations in the area?

- A. Routine analysis violation
- B. Drinking water rule violation
- C. MCL violation
- D. Human health violation
- E. Acute health risk violation
- F. None of the Above

389. According to the text, the type of contamination can pose an immediate threat to human health and notice must be given as soon as possible, but no later than 24 hours after notification from your laboratory of the test results.
A. True B. False

Public Notice

390. A public notice is required to be issued by a water system whenever it fails to comply with an applicable MCL or?

- A. Routine analysis D. Human health violation
B. Drinking water rule E. Fecal coliform or E. coli present
C. Treatment technique F. None of the Above

391. This term best describes what also is required whenever a water system fails to comply with its monitoring and/or reporting requirements or testing procedure.

- A. Routine analysis D. Public notice
B. Drinking water rule E. Fecal coliform or E. coli present count
C. MCL violation F. None of the Above

392. There shall be certain information, be issued properly and in a timely manner, and contain certain _____ on the public notice.

- A. Legal analysis D. Mandatory language
B. Drinking water rule information E. Fecal language
C. NOVs F. None of the Above

393. If there is a(n) _____ present to users, the timing and place of posting of the public notice may have different priorities.

- A. Routine analysis D. Human health violation
B. Drinking water rule E. Fecal coliform or E. coli present
C. Acute risk F. None of the Above

The following are acute violations:

394. Which is violation of nitrate?

- A. Presence D. Count
B. MCL E. Acute violations
C. MCLG F. None of the Above

395. Concerning total coliforms - when fecal coliforms or E. coli are present in the distribution system and is a violation of the?

- A. Presence D. Count
B. MCL E. Acute violations
C. MCLG F. None of the Above

**Waterborne Microorganisms and Bacteria Appendix
Classification**

396. Protozoa were commonly grouped in the kingdom of Protista together with the plant-like algae and fungus-like water molds and slime molds. In the 21st-century systematics, protozoans, along with ciliates, mastigophorans, and apicomplexans, are arranged as animal-like protists. However, protozoans are neither Animalia nor Metazoa (with the possible exception of the enigmatic, moldy Myxozoa).

- A. True B. False

397. These pseudopods are also used to capture prey; they simply engulf the food. They can detect the kind of prey and use different?

- A. Eukaryotic cell
- B. Protozoa(ns)
- C. Amoeba(s)
- D. 'Engulfing tactics'
- E. Cytoplasm
- F. None of the Above

398. Which term means or comprises a unique group of obligate, intracellular parasitic protozoa?

- A. Foraminifera
- B. Protozoan fauna
- C. Cytoplasm of protozoa
- D. Soil biomass
- E. Microsporidia
- F. None of the Above

399. Many protozoa have _____, which collect and expel excess water, and extrusomes, which expel material used to deflect predators or capture prey.

- A. Flagella
- B. Contractile vacuoles
- C. Vacuole or tonoplast
- D. Free-living amoebae
- E. Cell's cytoplasm
- F. None of the Above

400. According to the text, which bug/creature/organism are entirely distinct from prokaryotic flagella?

- A. Eukaryotes
- B. Bacteria or viruses
- C. Protozoa
- D. Free-living amoebae
- E. Centrioles
- F. None of the Above