Registration form

Distribution Primer 1 *Water Quality* $100.00
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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. _____

Name_____Signature_____
I have read and understood the disclaimer notice on page 2. Digitally sign XXX

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City_____State_____Zip_____

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Phone:
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Class/Grade_____

Please circle/check which certification you are applying the course CEU's.
Water Distribution ___ Water Treatment ___ Other _____

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You can obtain a printed version of the course manual from TLC for an additional $169.95 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.

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If you need this assignment graded and the results mailed to you within a 48-hour period, prepare to pay an additional rush service handling fee of $50.00. This fee may not cover postage costs. If you need this service, simply write RUSH on the top of your Registration Form. We will place you in the front of the grading and processing line.

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.

CERTIFICATION OF COURSE PROCTOR

Technical Learning College requires that our students who takes a correspondence or home study program course must pass a proctored course reading, quiz and final examination. The proctor must complete and provide to the school a certification form approved by the commission for each examination administered by the proctor.

Instructions. When a student completes the course work, fill out the blanks in this section and provide the form to the proctor with the examination.

Name of Course:_____

Name of Licensee:_____

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2. The licensee showed me positive photo identification prior to completing the examination.
3. The enclosed examination was administered under my supervision on _____. The licensee received no assistance and had no access to books, notes or reference material.
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Time to complete the entire course and final exam. _____

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Signature of Proctor

Distribution Primer 1 Answer Key

Name_____

Phone _____

Did you check with your State agency to ensure this course is accepted for credit?
No Refunds
You are responsible to ensure this course is accepted for credit.
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You can electronically complete this assignment in Adobe Acrobat DC.

Please Circle, Bold, Underline or X, one answer per question. A **felt tipped pen** works best.

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141. A B C D
142. A B C D
143. A B C D
144. A B C D
145. A B C D
146. A B
147. A B
148. A B
149. A B
150. A B C D

Please write down any questions you were not able to find the answers or that have errors.

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

DISTRIBUTION PRIMER 1 CEU COURSE
CUSTOMER SERVICE RESPONSE CARD

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PLEASE COMPLETE THIS FORM BY CIRCLING THE NUMBER OF THE APPROPRIATE ANSWER IN THE AREA BELOW.

Please rate the difficulty of your course.
Very Easy 0 1 2 3 4 5 Very Difficult

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How did you hear about this Course? _____

What would you do to improve the Course?

_____

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Any other concerns or comments.

_____

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When Finished with Your Assignment...

REQUIRED DOCUMENTS
Please scan the **Registration Page, Answer Key, Survey and Driver's License** and email these documents to info@TLCH2O.com.

IPhone Scanning Instructions
If you are unable to scan, take a photo of these documents with your **iPhone** and send these photos to TLC, info@TLCH2O.com.

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Rush Grading Service
If you need this assignment graded and the results mailed to you within a 48-hour period, prepare to pay an additional rush service handling fee of $50.00.

This course contains general EPA's SDWA federal rule requirements. Please be aware that each state implements water / sampling procedures/ safety / environmental / SDWA 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 be in compliance with your regulatory agencies and do not follow this course for any compliance concerns.

Distribution Primer 1 CEU Training Course Assignment

The Distribution Primer 1 CEU course assignment is 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 will have 90 days from receipt of this manual to complete it in order to receive your Professional Development Hours (PDHs) or Continuing Education Unit (CEU). A score of 70 % or better is necessary to pass this course. If you should need any assistance, please email all concerns and the completed ANSWER KEY to info@tlch2o.com.

Select one answer per question. Please utilize the answer key. (s) on the answer will indicate either plural and singular tenses.

Hyperlink to the Glossary and Appendix
http://www.abctlc.com/downloads/PDF/WTGlossary.pdf

Water Quality Section

Three Types of Public Water Systems

1. Approximately 52,000 systems serving the majority of the U.S. population
A. TNCWS C. NTNCWSs
B. CWSs D. None of the above

2. Provides water to the same people at least six months a year, but not all year (for example: schools, factories, churches, office buildings that have their own water system)
A. TNCWS C. NTNCWSs
B. CWSs D. None of the above

3. Provides water to the same population year-round for example: homes, apartment buildings.
A. TNCWS C. NTNCWSs
B. CWSs D. None of the above

4. Approximately 85,000 systems
A. TNCWS C. NTNCWSs
B. CWSs D. None of the above

5. Provides water where people do not remain for long periods of time for example: gas stations, campgrounds.
A. TNCWS C. NTNCWSs
B. CWSs D. None of the above

6. Approximately 18,000 water systems
A. TNCWS C. NTNCWSs
B. CWSs D. None of the above

Managing Water Quality at the Source

7. Contingent upon the region, source water may have several restrictions of use as part of a Water Shed Management Plan. In some areas, it may be restricted from recreational use, discharge or runoff from agriculture, or_____ .

A. Excess nutrients C. Industrial and wastewater discharge
B. Biological actions D. None of the above

8. Another characteristic of quality control is aquatic plants. The ecological equilibrium in lakes and reservoirs plays a natural part in purifying and sustaining the life of the lake. Certain vegetation removes the excess nutrients that would promote the growth of algae. Too much algae will imbalance the lake and kill fish.

A. True B. False

Physical Characteristics of Water

9. Physical characteristics are the elements found that are considered alkali, metals, and non-metals such as carbonates, fluoride,_____. The consumer relates it to scaling of faucets or staining.

A. pH and alkalinity C. Powdered activated carbon and chlorine
B. Sulfides or acids D. None of the above

10. Total Dissolved Solids (TDS) is not a primary pollutant; it is a gauge of appealing water characteristics such as hardness and an indication of an assortment of chemical contaminants that might be present, such as?

A. Turbidity C. Arsenic
B. Colloids D. None of the above

11. pH is the negative logarithm of the hydrogen ion concentration, $[H^+]$, a measure of the degree to which a solution is_____ .

A. Alkalinity C. Hydrogen ion (H^+)
B. Acidic or alkaline D. None of the above

12. _____ is a substance that can give up a hydrogen ion (H^+); a base is a substance that can accept H^+.

A. Acid C. Acidic or alkaline
B. Base D. None of the above

13. The more acidic a solution the greater the hydrogen ion concentration and the lower the pH; a pH of 7.0 indicates neutrality, a pH of less than 7 indicates acidity, and a pH of more than 7 indicates _____.

A. Acid C. Alkalinity
B. Base D. None of the above

Alkalinity

14. Alkalinity of water is its acid-neutralizing capacity. It is the sum of all the titratable bases. The measured value may vary significantly with the end-point pH used.

A. True B. False

15. Alkalinity is a measure of _____and can be interpreted in terms of specific substances only when the chemical composition of the sample is known.

A. Hydrogen ion (H^+) C. An aggregate property of water
B. Alkaline earth metal D. None of the above

16. Alkalinity is substantial in many uses and treatments of natural waters and wastewaters. Because the alkalinity of many surface waters is primarily a function of carbonate, bicarbonate, and hydroxide content, it is taken as an indication of the concentration of these constituents. The measured values also may include contributions from borates, phosphates, silicates or other bases if these are present.
A. True B. False

17. _____ with an overabundance of alkaline earth metal concentrations is significant in determining the suitability of water for irrigation.
A. Alkalinity C. Hydrogen ion (H^+)
B. Acid D. None of the above

18. Alkalinity measurements are used in the interpretation and control of water and wastewater treatment processes
A. True B. False

Turbidity Introduction
19. One physical feature of water is turbidity. A measure of the cloudiness of water caused by_____. The cloudy appearance of water caused by the presence of tiny particles.
A. Suspended particles C. Temperature fluctuation
B. Variations D. None of the above

20. High levels of turbidity may inhibit with proper water treatment and monitoring. If high quality raw water is low in turbidity, there will be a reduction in water treatment costs. Turbidity is unwanted because it causes health hazards.
A. True B. False

21. When heavy rains transpire, runoff into streams, rivers, and reservoirs occurs, causing turbidity levels to increase. In most cases, the particle sizes are relatively large and settle relatively quickly in both the water treatment plant and the source of supply. However, in some instances, fine, colloidal material may be present in the supply, which may cause some difficulty in the coagulation process.
A. True B. False

22. Generally, higher turbidity levels require higher coagulant dosages. However, seldom is the relationship between turbidity level and _____linear.
A. Coagulant dosage C. Temperature
B. Total Dissolved Solids (TDS) D. None of the above

23. Usually, the extra coagulant required is relatively small when turbidities are much higher than normal due to higher collision probabilities of the _____ during high turbidities.
A. Turbidity C. Total Dissolved Solids (TDS)
B. Colloids D. None of the above

24. Low _____waters can be very difficult to coagulate due to the difficulty in inducing collision between the colloids.
A. Turbidity C. Total Dissolved Solids (TDS)
B. Colloids D. None of the above

25. _____may be existing in a water supply due to pollution, and these colloids can be difficult to remove in the coagulation process. In this situation, higher coagulant dosages are generally required.
A. Turbidity C. Total Dissolved Solids (TDS)
B. Organic colloids D. None of the above

Turbidity MCL
26. An MCL for turbidity established by the EPA because _____interferes with disinfection. This characteristic of water changes the most rapidly after a heavy rainfall.
A. Conductivity C. Temperature
B. Turbidity D. None of the above

27. The temperature variation of a sample, a scratched or unclean sample tube in the nephelometer and selecting an incorrect wavelength of a light path may be conditions caused by an inaccurate _____ measurement.
A. Conductivity C. Temperature
B. Turbidity D. None of the above

Dissolved Oxygen
28. The level of dissolved oxygen in natural waters is often a direct indication of quality, since aquatic plants produce oxygen, while microorganisms generally consume it as they feed on _____.
A. Pollutants C. E. coli bacteria
B. Organic matter D. None of the above

29. At low temperatures, the _____is increased, so that in winter, concentrations as high as 20 ppm may be found in natural waters; during summer, saturation levels can be as low as 4 or 5 ppm.
A. Dissolved oxygen C. Solubility of oxygen
B. Thermal stratification D. None of the above

30. _____ is essential for the support of fish and other aquatic life and aids in the natural decomposition of organic matter.
A. Dissolved oxygen C. Solubility of oxygen
B. Thermal stratification D. None of the above

31. Thermal stratification is possible as water becomes less dense when heated, meaning water weighs less per unit volume. Therefore, warmer water will be lighter and colder water will be heavier. Due to this, there will always be a level of “self-induced” _____ in a water storage.
A. Saturation level(s) C. Permanent hardness
B. Thermal stratification D. None of the above

pH Testing Section
32. When an atom loses _____and thus has more protons than electrons, the atom is a positively-charged ion or cation.
A. A proton C. An electron
B. Charge D. None of the above

33. Measurement of pH for aqueous solutions can be done with a glass electrode and a pH meter, or using indicators like strip test paper.
A. True B. False

34. In chemistry, pH is a measure of the acidity or basicity of an aqueous solution. Solutions with a pH greater than 7 are said to be acidic and solutions with a pH less than 7 are basic or alkaline.
A. True B. False

35. Pure water has a pH very close to?
A. 7 C. 7.7
B. 7.5 D. None of the above

36. _____ are determined using a concentration cell with transference, by measuring the potential difference between a hydrogen electrode and a standard electrode such as the silver chloride electrode.
A. Primary pH standard values C. pH measurement(s)
B. Alkalinity D. None of the above

37. Mathematically, pH is the negative logarithm of the activity of the (solvated) hydronium ion, more often expressed as the measure of the?
A. Electron concentration C. Hydronium ion concentration
B. Alkalinity concentration D. None of the above

38. Which of the following terms for aqueous solutions can be done with a glass electrode and a pH meter, or using indicators?
A. Primary sampling C. Determining values
B. Measurement of pH D. None of the above

39. The pH scale is logarithmic and therefore pH is?
A. An universal indicator C. An excess of alkaline earth metal concentrations
B. A dimensionless quantity D. None of the above

40. Measuring alkalinity is important in determining a stream's ability to neutralize acidic pollution from rainfall or wastewater. It is one of the best measures of the sensitivity of the stream to acid inputs. There can be long-term changes in the _____ of rivers and streams in response to human disturbances.
A. Acid C. pH measurement(s)
B. Alkalinity D. None of the above

41. pH is defined as the decimal logarithm of the reciprocal of the_____, a_H+, in a solution.
A. Hydrogen ion activity C. Brønsted–Lowry acid–base theory
B. Acid-base behavior D. None of the above

42. Which of the following terms may be used to measure pH, by making use of the fact that their color changes with pH?
A. Indicators C. A set of non-linear simultaneous equations
B. Spectrophotometer D. None of the above

43. Alkalinity is the name given to the quantitative capacity of an aqueous solution to neutralize an?
A. Acid C. Bond formation
B. Base D. None of the above

44. Which of the following terms of the color of a test solution with a standard color chart provides a means to measure pH accurate to the nearest whole number?
A. Universal indicator C. Visual comparison
B. Colorwheel measurement D. None of the above

45. The calculation of the pH of a solution containing acids and/or bases is an example of a chemical speciation calculation, that is, a mathematical procedure for calculating the concentrations of all chemical species that are present in the solution. The complexity of the procedure depends on the?
A. Nature of the solution C. Alkaline earth metal concentrations
B. pH D. None of the above

46. Under normal circumstances this means that the concentration of hydrogen ions in acidic solution can be taken to be equal to the concentration of the acid. The pH is then equal to minus the logarithm of?
A. The concentration value C. A set of non-linear simultaneous equations
B. The pH D. None of the above

47. Alkalinity of water is its acid-neutralizing capacity. It is the sum of all the titratable bases. The measured value may vary significantly with the?
A. End-point pH C. pH measurement(s)
B. Alkalinity D. None of the above

48. For strong acids and bases no calculations are necessary except in extreme situations. The pH of a solution containing a weak acid requires the solution of a quadratic equation. The pH of a solution containing a weak base may require the?
A. Solution of a cubic equation C. Excess of alkaline earth metal concentrations
B. Non-linear simultaneous equations D. None of the above

49. Alkalinity is a measure of this missing term and can be interpreted in terms of specific substances only when the chemical composition of the sample is known.
A. Universal indicator C. Excess of alkaline earth metal concentrations
B. An aggregate property of water D. None of the above

50. More precise measurements are possible if the color is measured spectrophotometrically, using a?
A. Universal indicator C. Set of non-linear simultaneous equations
B. Colorimeter of spectrophotometer D. None of the above

51. For strong acids and bases no calculations are necessary except in extreme situations. The pH of a solution containing a weak acid requires?
A. The concentration value C. Excess of alkaline concentrations
B. The solution of a quadratic equation D. None of the above

52. Alkalinity in excess of which term is significant in determining the suitability of water for irrigation?
A. 8 C. Alkaline earth metal concentrations
B. pH of 7 D. None of the above

Objections to Hard Water-Scale Formation

53. Hard water forms scale, usually_____, which causes a variety of problems. Left to dry on the surface of glassware and plumbing fixtures, including showers doors, faucets, and sink tops; hard water leaves unsightly white scale known as water spots.

A. Magnesium carbonate C. Calcite
B. Calcium carbonate D. None of the above

More on the Stage 2 DBP Rule

54. Which of the following rules focuses on public health protection by limiting exposure to DBPs, specifically total trihalomethanes and five haloacetic acids, which can form in water through disinfectants used to control microbial pathogens?

A. Stage 2 DBP rule C. Long Term 2 Enhanced Surface Water Treatment Rule
B. Stage 1 DBPR D. None of the above

55. Safe Drinking Water Act (SDWA) has been highly effective in protecting public health and has evolved to respond to new and emerging threats to safe drinking water.

A. True B. False

56. Which of the following is one of the major public health advances in the 20th century?

A. Disinfection of drinking water C. Amendments to the SDWA
B. Water distribution D. None of the above

57. There are specific microbial pathogens, such as_____, which can cause illness, and are highly resistant to traditional disinfection practices.

A. Cryptosporidium C. Protozoa
B. E. coli host culture D. None of the above

58. The Stage 1 Disinfectants and Disinfection Byproducts Rule and_____, promulgated in December 1998.

A. Stage 1 DBPR C. Interim Enhanced Surface Water Treatment Rule
B. Stage 2 DBPR D. None of the above

59. Which of the following rules will reduce potential cancer and reproductive and developmental health risks from disinfection byproducts?

A. Stage 1 DBPR C. Long Term 2 Enhanced Surface Water Rule
B. Stage 2 DBPR D. None of the above

What are Disinfection Byproducts (DBPs)?

60. Which of the following form when disinfectants used to treat drinking water react with naturally occurring materials in the water?

A. Chloramines C. Disinfection byproducts (DBPs)
B. Humic and fulvic acids D. None of the above

61. Total trihalomethanes and haloacetic acids are widely occurring _____ formed during disinfection with chlorine and chloramine.

A. Gases C. Classes of DBPs
B. Substances D. None of the above

Are THMs and HAAs the only disinfection byproducts?

62. The presence of TTHM and HAA5 is representative of the occurrence of many other chlorination DBPs; thus, an increase of TTHM and HAA5 generally indicates an increase of DBPs from chlorination.

A. True B. False

All disinfectants form DBPs in one of two reactions:

63. Chorine and chlorine-based compounds (halogens) react with organics in water causing the hydrogen atom to substitute other atoms, resulting in halogenated by-products.

A. True B. False

Public Health Concerns

64. Results from toxicology studies have shown several DBPs (e.g., bromodichloromethane, bromoform, chloroform, dichloroacetic acid, and bromate) to be inert to laboratory animals.

A. True B. False

65. Other DBPs (e.g., chlorite, bromodichloromethane, and certain haloacetic acids) have also been shown to cause adverse mutations (extra chromosomes) in laboratory animals.

A. True B. False

Disinfection Byproduct Research and Regulations Summary

66. _____is unquestionably the most important step in the treatment of water for drinking water supplies.

A. DBP(s) C. Disinfection
B. Turbidity (particle) D. None of the above

67. The _____should not be compromised because of concern over the potential long-term effects of disinfectants and DBPs.

A. DBP(s) C. Microbial quality of drinking water
B. Turbidity (particle) D. None of the above

68. The risk of illness and death resulting from exposure to pathogens in drinking water is very much greater than the risks from_____.

A. Disinfectants and DBPs C. Natural organic matter precursors
B. Turbidity (particle) D. None of the above

Controlling Disinfection Byproducts

69. Treatment techniques are available that provide water suppliers the opportunity to maximize potable water safety and quality while minimizing the risk of _____.

A. DBP risks C. Disinfectants and DBPs
B. Turbidity (particle) D. None of the above

70. Generally, the best approach to reduce _____is to remove natural organic matter precursors prior to disinfection.

A. DBP(s) C. DBP formation
B. Turbidity (particle) D. None of the above

(S) Means the answer can be plural or singular in nature

Bacteriological Monitoring Section

Organisms Descriptors and Meanings

71. Photo means...
A. Feed or nourish C. Light
B. Other (Organic carbon) D. None of the above

72. Troph means...
A. Feed or nourish C. Light
B. Other (Organic carbon) D. None of the above

73. Litho means...
A. Rock C. Light
B. Organic D. None of the above

74. Organo means...
A. Rock C. Light
B. Organic D. None of the above

75. Auto means...
A. Without air C. Self (Inorganic carbon)
B. With air D. None of the above

76. Aerobic means...
A. Without air C. Self (Inorganic carbon)
B. With air D. None of the above

77. Chemo means...
A. Rock C. Chemical
B. Organic D. None of the above

78. Hetero means...
A. Feed or nourish C. Light
B. Other (Organic carbon) D. None of the above

Contaminants that may be present in sources of drinking water include:

79. Which of the following can be naturally occurring or be the result of oil and gas production and mining activities?
A. Radioactive contaminants C. Inorganic contaminants
B. Pesticides and herbicides D. Microbial contaminants

80. Which of the following like salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming?
A. Radioactive contaminants C. Inorganic contaminants
B. Pesticides and herbicides D. Microbial contaminants

81. Which of the following may come from a variety of sources such as agriculture, urban stormwater run-off, and residential uses?
A. Radioactive contaminants C. Inorganic contaminants
B. Pesticides and herbicides D. Microbial contaminants

82. Which of the following, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife?
A. Microbial contaminants C. Inorganic contaminants
B. Pesticides and herbicides D. All of the above

83. Which of the following can be synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can come from gas stations, urban stormwater run-off, and septic systems?
A. Organic chemical contaminants C. Inorganic contaminants
B. Pesticides and herbicides D. Microbial contaminants

Background
84. Coliform bacteria and chlorine residual are the only routine sampling and monitoring requirements for small ground water systems with chlorination. The coliform bacteriological sampling is governed by the Coliform Reduction amendment of the SDWA.
A. True B. False

TCR
85. The TCR recommends most of the Public Water Systems (PWS) to monitor their distribution system for bacteria according to the written sample sitting plan for that system.
A. True B. False

86. The sample sitting plan identifies sampling frequency and locations throughout the distribution system that are selected to be representative of conditions in the entire system.
A. True B. False

87. Coliform contamination may occur anywhere in the system, possibly due to problems such as; high pressure conditions, line fluctuations, or wells, and therefore routine monitoring is required.
A. True B. False

Routine Sampling Requirements
88. Each total coliform-positive (TC+) routine sample must be tested for the presence of heterotrophic bacteria.
A. True B. False

89. If any TC+ sample is also E. coli-positive (EC+), then the EC+ sample result must be reported to the state by the end of the month that the PWS is notified.
A. True B. False

90. If any routine sample is TC+, repeat samples are required. – PWSs on quarterly or annual monitoring must take a minimum of one additional routine samples (known as additional routine monitoring) the quarter following a TC+ routine or repeat sample.
A. True B. False

91. Total coliform samples must be collected by PWSs at sites that are representative of water quality throughout the distribution system according to a written sample siting plan subject to state review and revision.
A. True B. False

(S) Means the answer can be plural or singular in nature

92. For PWSs collecting more than one sample per month, collect total coliform samples at regular intervals throughout the month, except that ground water systems serving 4,900 or fewer people may collect all required samples on a single day if the samples are taken from different sites.
A. True B. False

93. Reduced monitoring is general available for PWSs using only surface water and serving 1,000 or fewer persons that meet certain additional PWS criteria.
A. True B. False

Dangerous Waterborne Microbes
94. Which of the following is a parasite that enters lakes and rivers through sewage and animal waste. It causes cryptosporidiosis, a mild gastrointestinal disease. The disease can be severe or fatal for people with severely weakened immune systems.
A. Coliform Bacteria C. Giardia lamblia
B. Cryptosporidium D. None of the above

95. Which of the following is a species of the rod-shaped bacterial genus Shigella?
A. Fecal coliform bacteria C. Shigella dysenteriae
B. Cryptosporidium D. None of the above

96. Which of the following can cause bacillary dysentery?
A. Fecal coliform bacteria C. Shigella
B. Cryptosporidium D. None of the above

97. Which of the following are Gram-negative, non-spore-forming, facultatively anaerobic, non-motile bacteria.
A. Fecal coliform bacteria C. Shigellae
B. Cryptosporidium D. None of the above

98. Which of the following are not necessarily agents of disease bacteria may indicate the presence of disease-carrying organisms?
A. Fecal coliform bacteria C. Shigella dysenteriae
B. Cryptosporidium D. None of the above

99. Which of the following is a parasite that enters lakes and rivers through sewage and animal waste. It causes gastrointestinal illness (e.g. diarrhea, vomiting, and cramps)?
A. Coliform Bacteria C. Protozoa
B. Cryptosporidium D. None of the above

100. Which of the following are microscopic organisms that live in the intestines of warm-blooded animals? They also live in the waste material, or feces, excreted from the intestinal tract. When fecal coliform bacteria are present in high numbers in a water sample, it means that the water has received fecal matter from one source or another.
A. Fecal coliform bacteria C. Shigella dysenteriae
B. Cryptosporidium D. None of the above

101. Which of the following are common in the environment and are generally not harmful? However, the presence of these bacteria in drinking water are 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. Coliform Bacteria C. Giardia lamblia
B. Cryptosporidium D. None of the above

102. Which of the following are bacteria whose presence indicates that the water may be contaminated with human or animal wastes? Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms.
A. Fecal Coliform and E. coli C. Shigella dysenteriae
B. Cryptosporidium D. None of the above

Bacteriological Monitoring Introduction
103. 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 C. Viruses
B. Amoebas D. None of the above

104. Indicators in common use today for routine monitoring of drinking water include total coliforms, fecal coliforms, and?
A. Cryptosporidium C. Escherichia coli (E. coli)
B. Protozoa D. None of the above

105. According to the text, the routine microbiological analysis of your water is for?
A. Contamination C. Coliform bacteria
B. Colloids D. None of the above

Bacteria Sampling
106. Water samples for _____must always be collected in a sterile container.
A. Amoebas C. Viruses
B. Bacteria tests D. None of the above

Methods
107. 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 C. Total coliform analysis
B. Coliform D. None of the above

Microbial Regulations
108. One of the key regulations developed and implemented by the United States Environmental Protection Agency (USEPA) to counter pathogens in drinking water is the Surface Water Treatment Rule.
A. True B. False

109. Among Surface Water Treatment Rule provisions, the rule requires that a public water system, using surface water (or ground water under the direct influence of surface water) as its source, have sufficient treatment to reduce the source water concentration of protozoa and coliform bacteria by at least 99.9% and 99.99%, respectively.
A. True B. False

(S) Means the answer can be plural or singular in nature

110. The Surface Water Treatment Rule suggests treatment criteria to assure that these performance recommendations are met; they may include turbidity limits, disinfectant residual and disinfectant contact time conditions.
A. True B. False

Basic Types of Water Samples
111. It is important to properly identify the type of sample you are collecting.
A. True B. False

The three (3) primary types of samples are:
112. 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 C. Routine
B. Special D. None of the above

113. A PWS fails to take every required repeat sample after any single TC+ sample
A. Trigger: Level 1 Assessment C. All of the above
B. Trigger: Level 2 Assessment D. None of the above

114. A PWS incurs an E. coli MCL violation.
A. Trigger: Level 1 Assessment C. All of the above
B. Trigger: Level 2 Assessment D. None of the above

115. A PWS collecting at least 40 samples per month has greater than 5.0 percent of the routine/repeat samples in the same month that are TC+.
A. Trigger: Level 1 Assessment C. All of the above
B. Trigger: Level 2 Assessment D. None of the above

116. A PWS has a second Level 1 Assessment within a rolling 12-month period.
A. Trigger: Level 1 Assessment C. All of the above
B. Trigger: Level 2 Assessment D. None of the above

117. A PWS on state-approved annual monitoring has a Level 1 Assessment trigger in 2 consecutive years.
A. Trigger: Level 1 Assessment C. All of the above
B. Trigger: Level 2 Assessment D. None of the above

118. A PWS collecting fewer than 40 samples per month has 2 or more TC+ routine/ repeat samples in the same month.
A. Trigger: Level 1 Assessment C. All of the above
B. Trigger: Level 2 Assessment D. None of the above

119. Noncommunity and nontransient noncommunity public water systems will sample at the same frequency as a like sized community public water system if:
1. It has more than 1,000 daily population and has ground water as a source, or
2. It serves 25 or more daily population and utilizes surface water as a source or ground water under the direct influence of surface water as its source.
A. True B. False

120. Noncommunity and nontransient, noncommunity water systems with less than 10,000 daily population and groundwater as a source will sample on an annual basis.
A. True B. False

Positive or Coliform Present Results

121. If you are notified of a positive coliform test result you need to contact either the Drinking Water Program or your local county health department within 72 hours, or by the next business day after the MCL compliance violation

A. True B. False

122. With a positive total coliform sample, after you have contacted an agency for assistance, you will be instructed as to the proper repeat sampling procedures and possible corrective measures for solving the problem. It is very important to initiate the _____as the corrective measures will be based on those results.

A. Perform routine procedures C. Corrective measures
B. Repeat sampling immediately D. None of the above

Heterotrophic Plate Count HPC

123. Heterotrophic Plate Count (HPC) --- formerly known as the Bac-T plate, 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

Heterotrophic Plate Count (Spread Plate Method)

124. Which of the following provides a technique to quantify the bacteriological activity of a sample?

A. Colonies C. Heterotrophic Plate Count
B. Agar D. None of the above

Total Coliforms

125. This 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

126. For systems which collect fewer than _____ samples per month, no more than one sample per month may be positive. In other words, the second positive result (repeat or routine) in a month or quarter results in a MCL violation.

A. 40 C. 200
B. 100 D. None of the above

The following are acute violations:

127. Which determines a violation of nitrate?

A. Presence C. MCLG
B. MCL D. None of the above

Revised Total Coliform Rule (RTCR) Summary

128. EPA published the Revised Total Coliform Rule (RTCR) in the Federal Register (FR) on February 13, 2013 (78 FR 10269). It is the revision to the 1989 Total Coliform Rule (TCR).

A. True B. False

129. The RTCR upholds the purpose of the 1989 TCR to protect public health by ensuring the duplicity of the drinking water distribution system and monitoring for the absence of microbial contamination.

A. True B. False

130. The RTCR establishes criteria for systems to qualify for and stay on for special increased monitoring, which could reduce water system problems for better system operation.
A. True B. False

131. The RTCR requires public water systems that are vulnerable to microbial contamination to identify and fix problems.
A. True B. False

132. The water provider shall collect repeat samples (at least 3) for each TC+ positive routine sample.
A. True B. False

133. For PWSs on quarterly or annual routine sampling, collect additional routine samples (at least 3) in the month after a _____ .
A. CCR(s) C. Total coliform positive samples
B. PN D. TC+ routine or repeat sample

134. PWSs incur violations if they do not comply with the requirements of the RTCR. The violation types are essentially the same as under the TCR with few changes. The biggest change is no acute or monthly MCL violation for _____only.
A. CCR(s) C. Total coliform positive samples
B. PN D. TC+ routine or repeat sample

135. Community water systems (CWSs) must use specific language in their CCRs when they must conduct an assessment or if they incur_____.
A. CCR(s) C. An E. coli MCL violation
B. PN D. TC+ routine or repeat sample

136. The water provider shall analyze all _____ that are total coliform positive (TC+) for E. coli.
A. Routine or repeat water samples C. Microbial contamination
B. Reduced monitoring D. Repeat water samples

137. The RTCR requires public water systems (PWSs) to meet a legal limit for E. coli, as demonstrated by required monitoring.
A. True B. False

138. The RTCR suggests the frequency and timing of required microbial testing based on, public water type and source water type.
A. True B. False

139. The water provider shall develop and follow a sample-siting plan that designates the PWS's collection schedule. This includes location of_____.
A. Routine and repeat water samples C. Microbial contamination
B. Reduced monitoring D. Repeat water samples

140. The water provider shall collect _____on a regular basis (monthly, quarterly, annually). Have samples tested for the presence of total coliforms by a state certified laboratory.
A. Routine water samples C. Microbial contamination
B. Reduced monitoring D. Repeat water samples

141. PN is required for violations incurred. Within required timeframes, the PWS must use the required health effects language and notify the public if they did not comply with certain requirements of the RTCR. The type of _____ depends on the severity of the violation.
A. CCR(s) C. MCL violation
B. PN D. TC+ routine or repeat sample

Disinfection Key
142. The RTCR requires 99.99% or 4 log inactivation of _____ .
A. Enteric viruses C. Giardia lamblia cysts
B. Crypto D. None of the above

143. The RTCR requires 99% or 2 log inactivation of _____ .
A. Enteric viruses C. Giardia lamblia cysts
B. Crypto D. None of the above

144. The RTCR requires 99.9% or 3 log inactivation of _____.
A. Enteric viruses C. Giardia lamblia cysts
B. Crypto D. None of the above

145. The RTCR requires the chlorine residual leaving the plant must be = or _____ mg/L and measurable throughout the system.
A. > 0.2 C. 0.2
B. 2.0 D. None of the above

Waterborne Bacterial Diseases
146. Campylobacteriosis outbreaks have most often been associated with food, especially chicken and un-pasteurized milk, as well as un-chlorinated water. These organisms are also an important cause of “travelers’ diarrhea.” Medical treatment generally is not prescribed for campylobacteriosis because recovery is usually rapid.
A. True B. False

147. Cholera, Legionellosis, salmonellosis, shigellosis, yersiniosis, are other bacterial diseases that can be transmitted through water. All bacteria in water are readily killed or inactivated with chlorine or other disinfectants.
A. True B. False

148. Campylobacteriosis is the most common diarrheal illness caused by bacteria. Other symptoms include abdominal pain, malaise, fever, nausea and vomiting; and begin three to five days after exposure. The illness is frequently over within two to five days and usually lasts no more than 10 days.
A. True B. False

Viruses
Coronavirus
149. It looks like the COVID-19 coronavirus is not able to live in water.
A. True B. False

Chain of Custody Procedures
150. 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. TC Plan C. Samples transfer possession
B. Sample siting plan D. None of the above