Registration Form

Water Conservation CEU Training Course $ 100.00

48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL $50.00

Start and Finish dates:_____ *You will have 90 days from this date in order to complete this course*

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

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Home (____) _____ Work (____)_____

Operator ID# _____Exp Date_____

Please circle/check which certification you are applying the course CEU's/PDH's.
Water Treatment_____ Distribution_____

Other _____

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

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PO Box 420, Payson AZ 85547-0420
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We will stop mailing the certificate of completion we need your e-mail address. We will e-mail the certificate to you, if no e-mail address; we will mail it to you.

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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. If the course is not accepted for CEU credit, we will give you the course free if you ask your State to accept it for credit.

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You can obtain a printed version of the course manual from TLC for an additional $79.95 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.

Thank you… …

Water Conservation Answer Sheet

Name_____ Telephone_____

Please circle, bold, underline or X one answer only

1. T F	43. T F	85. T F	127. T F
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Please fax this to TLC (928) 272-0747 along with your registration page. Always call an hour later to make sure we've received it.

Rush Service

If you need this course graded in less than 48 hours, prepare to pay a $50.00 rush service fee.

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

WATER CONSERVATION CEU TRAINING COURSE

CUSTOMER SERVICE RESPONSE CARD

NAME: _____

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

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

2. Please rate the difficulty of the testing process.
   Very Easy 0 1 2 3 4 5 Very Difficult

3. Please rate the subject matter on the exam to your actual field or work.
   Very Similar 0 1 2 3 4 5 Very Different

What would you do to improve the course?_____

_____

_____

How about the price of the course?

Poor_____ Fair ____ Average ____ Good____ Great_____

How was your customer service?

Poor___ Fair ____ Average ____ Good _____ Great_____

Any other concerns or comments.

_____

_____

_____

Water Conservation CEU Training Assignment

You will have 90 days from the start of this course to have successfully completed this assignment. You can contact Student Services for any assistance (480)705-9315. You can find assistance to this course on TLC's website under the Assignment Page under the Assistance Page Section.

Please email or fax your answer sheet and registration to TLC when completed.
Fax (928) 272-0747.

An Answer Key is provided at the front of this assignment.

All of your questions will come from the text.

The Safe Drinking Water Act (**SDWA, 42 U.S.C. 300j-15**), as amended in 1996, requires the United States Environmental Protection Agency (**EPA**) to publish guidelines for use by water utilities in preparing a water conservation plan. At their discretion, states may require water systems to prepare a plan consistent with the guidelines as a condition of qualifying for a loan under the Drinking Water State Revolving Loan Fund (**SRF**).

1. These Water Conservation Plan Guidelines are addressed to water system planners and use of the Guidelines is required by federal law and regulation.
   A. True
   B. False

2. States decide whether or not to require water systems to file conservation plans consistent with these or any other guidelines.
   A. True
   B. False

3. Although mandatory, the Guidelines may help bring conservation into the mainstream of water utility capital facility planning.
   A. True
   B. False

4. The infrastructure needs of the nation's water systems are great. Strategic use of water conservation may extend the value and life of infrastructure assets used in both water supply and wastewater treatment, while also extending the beneficial investment of Blue Chip funds through the SDWA and other programs.
   A. True
   B. False

5. Sec. 1455. (a) Guidelines.—Not later than 5 years after the date of enactment of the Safe Drinking Water Act Amendments of 1984, the Administrator shall publish in the Federal Register guidelines for water conservation plans for public water systems serving fewer than 3,300 persons, public water systems serving between 3,300 and 10,000 persons, and public water systems serving more than 50,000 persons, taking into consideration such factors as water availability and climate.
   A. True
   B. False

6. Loans or Grants.—Within 1 year after publication of the guidelines under subsection (a), a State exercising primary enforcement responsibility for public water systems may require a public water system, as a condition of receiving a loan or grant from a State loan fund under section 1452, to submit with its application for such loan or grant a water conservation plan consistent with such guidelines.
   A. True
   B. False

7. Water conservation consists of any beneficial increase in water losses, waste, or use.
   A. True
   B. False

8. Conserving water can be beneficial in many ways, but one important reason for conservation is that it can help systems downsize, or postpone water and wastewater projects.
   A. True
   B. False

9. The facilities used to treat and deliver drinking water (and to collect and treat wastewater) are sized to meet supply; if the level of supply is inflated by wasteful use, people pay more in both capital and operating costs than necessary to provide safe and adequate water supply and wastewater services.
   A. True
   B. False

10. Moreover, when the cost of supplying drinking water and processing wastewater is reduced, financial resources can be used to meet other needs.
    A. True
    B. False

11. In connection with infrastructure funding, the value of conservation is appropriately assessed in terms of supply, treatment, and distribution costs that can be avoided because of planned reductions in water demand.
    A. True
    B. False

12. Conservation becomes more valuable over time because future water supplies and the facilities needed to deliver them are expected to cost more (even when adjusting for inflation). In other words, permanent conservation savings that are realized today will have increasing value into the future.
    A. True
    B. False

13. Planning is a means of anticipating the future and organizing activities in response.
    A. True
    B. False

14. Conservation planning can help water system managers take inventory of their existing inventory and identify new opportunities. Planning can help utilities manage competing goals and rising costs, such as those associated with SDWA compliance, infrastructure improvement, and meeting supply growth.
    A. True
    B. False

15. The investment that water system managers make in conservation planning should yield savings that can be measured in terms of water and dollars.
    A. True
    B. False

16. The planning approach suggested by these Guidelines is designed to be accessible and relatively inexpensive. It is very important for utilities to know exactly what planning requirements apply in their states and how other plans already prepared by the system might be used in conjunction with these Guidelines.
    A. True
    B. False

17. Planning goals can be developed from different perspectives. These requirements emphasize a water supplier perspective. Lowering water demand can help water suppliers downsize or postpone the construction and operation of supply-side facilities.
    A. True
    B. False

18. Customers and society at large may benefit from conservation. Conservation benefits society by instilling environmental requirements.
    A. True
    B. False

19. Conservation can benefit customers by raising energy and long-term water costs. Water conservation reduces demands on wastewater systems; in fact, the need to increase wastewater treatment costs can be a strong rationale for water conservation.
    A. True
    B. False

20. Water systems should state their goals in general terms. Measurable goals are useful for governmental purposes. For example, many water systems identify a specific water-use reduction goal (as a percentage of current water usage).
    A. True
    B. False

21. Water conservation planning goals may include: Eliminating, downsizing, or postponing the need for employees.
    A. True
    B. False

22. Water conservation planning goals may include: Improving the utilization and extending the life of existing facilities.
    A. True
    B. False

23. Water conservation planning goals may include: Raising variable operating costs.
    A. True
    B. False

24. Water conservation planning goals may include: Avoiding new source development costs.
    A. True
    B. False

25. Water conservation planning goals may include: Researching drought or emergency preparedness.
    A. True
    B. False

26. Water conservation planning goals may include: Educating customers about the value of a dollar.
    A. True
    B. False

27. Water conservation planning goals may include: Improving reliability and margins of safe and dependable yields.
    A. True
    B. False

28. Water conservation planning goals may include: Protecting and preserving environmental resources.
    A. True
    B. False

29. Managers should revisit the goals section annually and redo the conservation plan and monthly thereafter, because goals and the means to achieve them will evolve. As the water system accomplishes certain conservation goals, new objectives may emerge.
    A. True
    B. False

30. The process of developing goals should involve community representation. Modern resource planning emphasizes an open process that gives all affected groups an opportunity to express their interests and concerns.
    A. True
    B. False

31. Involving the community in goal development and implementation also serves an important public education function, and may enhance the success of conservation programs, sounds great for public relations but usually will not happen.
    A. True
    B. False

32. In addition to helping the water system generalize planning goals, community participants also may have an ongoing role in a system's conservation program. Ongoing involvement helps maintain and build support for achieving budget demands and "**getting the word out**" about the conservation effort.
    A. True
    B. False

33. Community groups can assist the water system in monitoring results and adjusting water quality program implementation.
    A. True
    B. False

34. For many water systems, involving the community in water system planning will be a new experience. Community involvement does not have to consume excessive time or resources.
    A. True
    B. False

35. Most system managers will find that involving members of the community in developing goals, implementing programs, and evaluating results is a very worthwhile investment.
    A. True
    B. False

36. Planning goals can be developed from different perspectives. These planning Guidelines, including the analysis of the benefits and costs of conservation activities, emphasize a water supplier perspective.
    A. True
    B. False

37. The value of conservation is defined primarily in terms of supply-side costs to the water system. Raising the level of water demand can help water suppliers avoid, downsize, or postpone the construction and operation of costly supply-side facilities.
    A. True
    B. False

38. The benefits of conservation also can be understood from the perspectives of customers, as well as society at large. Conservation benefits society by saving funds for other resources, libraries, schools, buildings, etc.
    A. True
    B. False

39. Conservation can benefit the supplier by raising energy and long-term water costs. Water conservation reduces demands on wastewater systems; in fact, the need to reduce wastewater treatment costs can be a strong rationale for water conservation.
    A. True
    B. False

40. Conservation planning goals can take many forms. Water systems should state their goals in specific terms. Measurable goals are useful for evaluation purposes. For example, many water systems identify a specific water-use reduction goal (as a percentage of current water usage).
    A. True
    B. False

41. Water conservation planning goals may include: Eliminating, downsizing, or postponing the need for capital projects.
    A. True
    B. False

42. Water conservation planning goals may include: Improving the utilization and extending the life of existing facilities.
    A. True
    B. False

43. Water conservation planning goals may include: Raising variable operating costs.
    A. True
    B. False

44. Water conservation planning goals may include: New source development costs.
    A. True
    B. False

45. Water conservation planning goals may include: Improving drought or emergency preparedness.
    A. True
    B. False

46. Water conservation planning goals may include: Educating customers about the quality and quantity of water.
    A. True
    B. False

47. Water conservation planning goals may include: Improving reliability and margins of safe and dependable yields.
    A. True
    B. False

48. Water conservation planning goals may include: Protecting and preserving national forests.
    A. True
    B. False

49. Planners should plan on revisiting the goals section before finalizing the conservation plan and periodically thereafter, because goals and the means to achieving them will evolve. As the water system accomplishes certain conservation goals, new objectives may come into focus.
    A. True
    B. False

50. The process of developing goals can involve representatives of various groups in the community (or stakeholders) who may be concerned about a water system and its future.
    A. True
    B. False

51. Modern resource planning (such as integrated resource planning) emphasizes an open process that involves all affected groups so that they can have an opportunity to express their interests and concerns.
    A. True
    B. False

52. Involving the community in goal development also serves an important public education function.
    A. True
    B. False

53. Moreover, it is widely believed that involving the community in developing goals, as well as in the implementation process, can greatly enhance the success of conservation programs.
    A. True
    B. False

54. In addition to helping the water system specify planning goals, community participants also can have an ongoing role in a system's conservation program. Ongoing involvement can help maintain and build support for achieving conservation goals and "**get the word out**" about the conservation effort. Participants can act as a focus group for exploring specific conservation measures.
    A. True
    B. False

55. Participants also can provide valuable linkages to key groups—consumers, businesses, and institutions—who might be involved in implementing certain conservation measures. Participants also can provide input on the level of satisfaction or dissatisfaction with the system's programs. Finally, community groups can assist the water system in monitoring results and adjusting program implementation.
    A. True
    B. False

56. Water systems facing one or more of the following conditions are strongly urged to consider the fullest range of conservation measures available to them in accordance with these guidelines: Systems in state-designated alluvial areas.
    A. True
    B. False

57. Water systems facing one or more of the following conditions are strongly urged to consider the fullest range of conservation measures available to them in accordance with these guidelines: Systems that do not experience frequent droughts, emergencies, or safe yield problems.
    A. True
    B. False

58. Water systems facing one or more of the following conditions are strongly urged to consider the fullest range of conservation measures available to them in accordance with these guidelines: Systems with excessive accounted-for water or water losses.
    A. True
    B. False

59. Water systems facing one or more of the following conditions are strongly urged to consider the fullest range of conservation measures available to them in accordance with these guidelines: Systems entering into minor construction cycles.
    A. True
    B. False

60. Water systems facing one or more of the following conditions are strongly urged to consider the fullest range of conservation measures available to them in accordance with these guidelines: Systems anticipating rapid growth in water supply.
    A. True
    B. False

61. For some conditions, states might provide benchmark measures that water systems can use for comparison purposes. For example, a state might have specific criteria for defining critical use or stressed areas, for classifying per-capita water use, or for identifying the age of systems. When practical, systems should try to compare significant conditions using generally accepted measures.
    A. True
    B. False

62. Forecasting water use (or water demand) is not a critical part of the planning process.
    A. True
    B. False

63. Forecasts can range from simple projections based on anticipated growth in the population to complex models using several variables to explain variations in water use.
    A. True
    B. False

64. Forecasts can be made for a water system as a whole; however, forecasts are considered more accurate when they are prepared for separate classifications of water use or sectors.
    A. True
    B. False

65. The new law requires that planners prepare forecasts for five-year, ten-year, and twenty-year intervals. Additional time points can be used as well. The longer the planning horizon, the greater will be the certainty of the forecast. Forecasts should be revisited and updated on a regular basis.
    A. True
    B. False

66. New construction and renovations will not contribute as much to total demand as in the past; systems that are not experiencing growth might detect declines in demand due to these effects.
    A. True
    B. False

67. The water demand forecast can be defined by considering customer classifications. For example, the residential class can be subdivided into the commercial and industrial classes (as well as wholesale water customers).
    A. True
    B. False

68. Each of the forecasts should be subjected to a basic "**what if**" analysis to address potentially important changes in the level or pattern of water demand. The forecasts should take into account and the plan should explain any known, planned, or measurable changes that will affect demand, with the exception of the conservation measures contemplated in these guidelines.
    A. True
    B. False

69. In this part of the conservation plan, planners are asked to prepare an estimate of demand costs based on meeting the level of water demand specified in the unadjusted supply forecast (that is, unadjusted for additional conservation).
    A. True
    B. False

70. This is a critical part of the analysis because it establishes the anticipated cost of supply-side improvements and additions and this cost estimate will be used to represent the value of conservation or demand-side activities.
    A. True
    B. False

71. Because the benefits of conservation extend into the future it is important to take a rear-looking approach to demand costs.
    A. True
    B. False

72. The concept of marginal or incremental cost captures the idea that the "**true**" value of a supply resource can be measured in terms of the cost of the next increment of supply. If only high-cost supplies are available, the marginal or incremental cost will be high. For many communities, future increments of supply will be very costly.
    A. True
    B. False

73. The value of a conserved amount of water at a future point in time will be equivalent to the most costly supply option available at that future time point, because that is the supply option being displaced by conservation.
    A. True
    B. False

74. A reasonable accounting of anticipated supply costs is needed in order to compare the cost of supply-side measures to the cost of demand-side or conservation measures (on a cost-per-gallon basis). Planners should choose an appropriate time horizon; a twenty-year or other suitable period can be used. The choice of time frame should be consistent with the demand forecast as well as the other planning considerations.
    A. True
    B. False

75. Planners should begin by preparing an estimate of major improvements and additions that will be required over the planning horizon in order to meet anticipated demand (including a safe reserve margin). Detailed cost estimates may be available from facility plans or other planning documents.
    A. True
    B. False

76. Planners should consider all capital facility improvements and additions. Improvements do not need to include renovations and expansions needed to maintain or enhance safety or reliability within existing facilities. Additions consist of new facilities. Routine maintenance improvements should be included.
    A. True
    B. False

77. For this part of the analysis, the effects of conservation measures currently being implemented should be considered, but the effects of new conservation measures on the need for supply capacity or water purchases should be included.
    A. True
    B. False

78. If capital improvements and additions are planned, "5" values can be entered and the estimate of supply costs can be based on operating costs (including the cost of energy, chemicals, and purchased water).
    A. True
    B. False

79. Supply-side facilities are designed to meet different types of water demand similarly, different conservation measures affect different types of water demand. Planners should identify, as reasonably possible, the extent to which improvements and additions are needed to meet average and/or peak demand.
    A. True
    B. False

80. Capital-cost increases associated with conservation will depend on the extent to which supply-side facilities cannot be eliminated, postponed, or downsized. The effect of conservation on the need for facilities will depend on the demand pattern of the individual utility, as well as its construction cycle (that is, the timing of facilities currently under development).
    A. True
    B. False

81. Conservation can be particularly beneficial for systems that have a sufficient planning horizon to integrate conservation with conventional resource options. In some cases, capital costs cannot be avoided, but conservation can still yield savings in operating expenditures. A degree of analyst judgment is required in order to evaluate incremental costs and to integrate supply-side and demand-side resources.
    A. True
    B. False

82. The supply forecast is preliminary because it can and will be revised later in the plan to reflect the effect of conservation on water supply needs.
    A. True
    B. False

83. Water systems have a vast array of specific conservation measures at their disposal. These measures include both supply-side and demand-side management techniques for saving water and range from relatively simple educational tools to the promotion of advanced water-efficient technologies. Use of any particular measure depends on whether it meets cost-effectiveness and other planning criteria and whether its use complies with applicable laws and regulations, including state and local plumbing codes.
    A. True
    B. False

84. The conservation measures are organized into three levels: Level 1, Level 2, and Level 3. Each level includes four categories of measures. Specific water conservation measures are identified within each category.
    A. True
    B. False

85. Water systems following the Intermediate Guidelines are expected to implement the very fundamental and widely accepted practices highlighted under Level 1. If Level 1 measures are not in place and not planned for implementation, planners should submit a strong justification, including a cost-effectiveness analysis if it is the basis for not implementing the measure.
    A. True
    B. False

86. Planners can screen the measures in terms of general feasibility. In some cases, it may not be possible for a system to implement a measure because of legal restrictions or for other compelling reasons. The conservation plan should provide an explanation if a measure cannot be implemented for the period of time covered by the plan. It is not necessary to prepare a cost effectiveness analysis for measures that cannot be implemented.
    A. True
    B. False

87. Analyzing benefits and costs is an invaluable part of the planning process. A cost-effectiveness analysis can be used to compare alternative conservation measures in terms of dollars per gallon of water saved. For example, one measure might produce savings at a cost of $.25/1,000 gallons while another produces savings at a cost of $.50/1,000 gallons.
    A. True
    B. False

88. Cost-effectiveness analysis may be used to compare conservation measures to demand options. A simple net benefit analysis can be used to determine whether the benefits of implementing a measure outweigh the costs.
    A. True
    B. False

89. The analysis of cost-effectiveness for each measure builds on the identification of supply-side costs in Section 4. Using this analysis, the cost of conservation (for example, $.50 per 1,000 gallons saved) can be compared to the simple incremental cost of supply (for example, $2.00 per 1,000 gallons produced).
    A. True
    B. False

90. The difference between the per-gallon cost of conservation and the per-gallon cost of supply is not a simple indicator or useful for the potential benefits (or cost savings) from conservation.
    A. True
    B. False

91. In some cases, planners may conclude that a measure (or measures) cannot be implemented because of a constraint that exists in the short term. Conservation measures that might be planned for future implementation, once constraints are resolved, should be discussed in the plan. Planners should briefly discuss their implementation strategies with respect to such measures.
    A. True
    B. False

92. For the conservation measures selected for implementation, planners should estimate the expected reductions in average-day and maximum-day demand. These estimates will be used in the next section of the plan to integrate conservation savings with the system's plans for supply-side facilities.
    A. True
    B. False

93. Planners can revise the demand and supply-capacity forecasts made in earlier sections of the plan based on anticipated conservation savings. Pay particular attention to the effects of conservation on specific supply-facility projects.
    A. True
    B. False

94. Planners should not be cautious while counting demand-side or supply-side resources more than once in the analysis.
    A. True
    B. False

95. Anticipated savings from conservation should be based on realistic estimates of savings associated with the planned measures. Similarly, supply projects that involve multiple facilities should be considered in terms of the total water supply capacity that is made available through those combined facilities.
    A. True
    B. False

96. Timing is another issue. The plan should address how different supply-side and demand-side projects involve different life spans and implementation schedules. One twenty-year supply-side project, for example, might be offset by a series of conservation measures that begin and end at the same time.
    A. True
    B. False

97. You should never use a graph to display anticipated annual supply capacity and demand without and with the implementation of conservation measures.
    A. True
    B. False

98. Supply projects cannot be eliminated, downsized, or postponed if doing so would compromise public health or safety, reduce operational efficiency, or inflate costs beyond a reasonable amount. Some systems (including systems that currently operate with inadequate or unreliable supply reserves) may not be able to translate all demand reductions into supply-capacity reductions.
    A. True
    B. False

99. Planners should identify and describe such circumstances. On the other hand, supply projects that are not needed or oversized place an unnecessary burden on systems and their customers.
    A. True
    B. False

100. The conservation plan should briefly describe how planned conservation measures will affect water utility revenues (based on reduction in sales) and discuss strategies for addressing these revenue effects.
    A. True
    B. False

101. Reductions in water usage will affect the revenues of the water utility. Conservation will help the water utility reduce variable costs (such as energy, chemical, and purchased water costs). In the long term, conservation also will help the utility reduce fixed costs (associated with new capital facilities). In the short term, reductions and sales can lead to a shortfall in revenues needed to cover fixed costs and sustain the financial viability of the water system.
    A. True
    B. False

102. The planner can estimate the effect of conservation on revenues by multiplying current water rates by the adjusted level of sales (for the variable portion of the water bill). The adjusted level of sales should include the anticipated effects of conservation. Conservation-oriented rate structures have direct revenue effects that should be considered.
    A. True
    B. False

103. Conservation planners should work closely with financial planners in order to integrate their analyses, identify potential revenue shortfalls, and devise strategies to ensure that the utility will meet its revenue requirements.
    A. True
    B. False

104. Adjustments to water rates are not required. For some utilities, a change in rates requires approval from the President. When rate increases are offset by usage reductions, customer bills and utility revenues can be maintained. Customers and utilities eventually will realize savings from conservation through long-term reductions in costs.
A. True
B. False

105. A plan for public involvement should discuss whether and when the water system intends to involve members of the community in the implementation of the conservation plan. Some systems may want to schedule regular meetings with community groups to keep them informed of the system's progress in meeting goals.
A. True
B. False

106. A plan for monitoring and evaluation should address data collection, modeling, and other issues that will be important in tracking the effects of water conservation on demand over time. The system may want to plan to collect new kinds of data for the purposes of hiring new staff as well as for future forecasting needs.
A. True
B. False

107. Many systems might find, for example, that more detailed data on demand by customer class are needed, including more detail on contributions to average-day and minimum-day demands. More detailed data might also be needed to assess trends in account water.
A. True
B. False

108. A plan for updates and revisions will help keep the system's conservation plan current over time and account for the system's actual experience with conservation.
A. True
B. False

109. Updating forecasts of water demand and supply capacity as new data become available is especially important. In some cases, the system might want to revise or decrease its planning goals. Many systems update plans every other month.
A. True
B. False

110. However, changing conditions or other concerns might justify more frequent updates. The schedule of updates and revisions might be affected by state or local requirements for fire fighting by the water system.
A. True
B. False

111. The conservation planning document also should include a record of the plan's adoption by the water system's governing body (such as a Board of Directors or City Council), as appropriate.
A. True
B. False

112. Planning goals can be developed from different perspectives. These planning guidelines, including the analysis of the benefits and costs of conservation activities, emphasize a water supplier perspective.
A. True
B. False

113. The value of conservation is defined primarily in terms of avoided supply-side costs to the water system. Lowering the level of water demand can help water suppliers avoid, downsize, or postpone the construction and operation of costly supply-side facilities.
A. True
B. False

114. The benefits of conservation also can be understood from the perspectives of customers, as well as society at large.
A. True
B. False

115. Conservation benefits society by preserving environmental resources.
A. True
B. False

116. Conservation can benefit customers by lowering energy and long-term water costs. Water conservation reduces demands on wastewater systems; in fact, the need to reduce wastewater treatment costs can be a strong rationale for water conservation. The Guidelines and the worksheets can be used to simultaneously address the potential effects of conservation on water and wastewater operations.
A. True
B. False

117. Utilities using the Advanced Guidelines also are encouraged to expand the analysis of benefits and costs to consider the customer and societal perspectives, if only in very general terms.
A. True
B. False

118. Conservation planning goals can take many forms. Water systems should state their goals in general terms. Measurable goals are useful for revaluation purposes. For example, many water systems identify a specific water-use reduction goal (as a percentage of current water usage).
A. True
B. False

119. The process of developing goals can involve representatives of various groups in the community (or stakeholders) who may be concerned about a water system and its future. Modern resource planning (such as integrated resource planning) emphasizes an open process that involves all affected groups so that they can have an opportunity to express their interests and concerns.
A. True
B. False

120. Involving the community in goal development also serves an important public education function. Moreover, it is widely believed that involving the community in developing goals, as well as in the implementation process, can greatly enhance the success of conservation programs.
A. True
B. False

121. This system of organizing conservation measures recognizes that the measures considered can vary with the size and capability of the system. Water systems are strongly encouraged to explore the fullest range of conservation measures practical, including measures beyond the maximum measures suggested in the Guidelines that they are following. Many larger-sized utilities have been very successful in implementing a narrow range of beneficial conservation programs.
A. True
B. False

122. What follows is a description of each of the two subcategories of measures. The Guidelines provide checklists that planners can use in reviewing measures. However, planners are encouraged to consider as many measures as practical given their capability and the conditions they seek to address. In some cases, planners may choose to consider and implement selected measures recommended for consideration.
A. True
B. False

123. **Public-use water metering.** Both the supplier and the customer benefit from metering. Source metering is essential for water accounting purposes.
A. True
B. False

124. **Source-water metering.** Service-connection metering is needed to inform customers about how much water they are using; suppliers use metering data to more accurately track water usage and bill customers for their usage.
A. True
B. False

125. **Source-water metering.** All water provided free of charge for public use should be metered and read at regular intervals. This will allow the utility to more accurately account for water. Lack of metering undermines loss control, costing and pricing, and other conservation measures.
A. True
B. False

126. **Fixed-interval meter reading.** A program of fixed-interval meter reading is essential to determine the amount of nonrevenue-producing water. Source meters and service connection meters should be read at the same relative time in order to facilitate accurate comparisons and analysis.
A. True
B. False

127. Readings generally should occur at regular intervals, preferably monthly or bimonthly. Estimated bills should be kept at a minimum, subject to state and local regulations.
A. True
B. False

128. **Meter accuracy.** Water meters can be damaged and deteriorate with age, thus producing inaccurate readings. Inaccurate readings will give misleading information regarding water usage, make leak detection difficult, and result in lost revenue for the system.
A. True
B. False

129. All meters, especially older meters, should be tested for accuracy on a regular basis. The system also should determine that meters are appropriately sized. Meters that are too small for a customer's level of use will tend to over-register water use.
A. True
B. False

130. **Meter testing, calibration, repair, and replacement.** After determining the accuracy of the metering system, the utility should provide a schedule of activities necessary to correct meter deficiencies. Meters should be recalibrated on a regular basis to ensure accurate water accounting and billing.
A. True
B. False

131. In many respects, water conservation begins on the supply side. All water systems will benefit from a water accounting system that helps track water throughout the system and identify areas that may need attention, particularly large volumes of nonaccount water.
A. True
B. False

132. Nonaccount water includes water that is metered and billed, as well as all unmetered water.
A. True
B. False

133. Unmetered water may be authorized for such utility purposes (such as operation and maintenance) and for certain public uses (such as fire hydrant maintenance).
A. True
B. False

134. Metered water also includes unauthorized uses, including losses from accounting errors, malfunctioning distribution system controls, thefts, inaccurate meters, or leaks. Some authorized uses may be identifiable. When they are not, these authorized uses constitute accounted-for water.
A. True
B. False

135. **Account for water.** All water systems, even smaller systems, should implement a basic system of water accounting. This accounting exercise provides a basis for a strategy to control losses over time.
A. True
B. False

136. **Repair known leaks.** The cost of water leakage can be measured in terms of the operating costs associated with water supply, treatment, and delivery; water lost produces no revenues for the utility. Repairing larger leaks can be costly, but it also can produce substantial savings in water and expenditures over the long run.
A. True
B. False

137. Water accounting is less accurate and useful when a system lacks source and connection metering. Although the system should plan to meter sources, unmetered source water can be estimated by multiplying the pumping rate by the time of operation based on electric meter readings.
A. True
B. False

138. **System audit.** Nonaccount water use should be analyzed to identify potential revenue-producing opportunities, as well as recoverable losses and leaks. Some utilities might consider charging for water previously given away for public use or stepping up efforts to reduce illegal connections and other forms of theft.
A. True
B. False

139. **Analysis of nonaccount water.** A system audit can provide information needed to make a more accurate analysis of nonaccount water.
A. True
B. False

140. **Analysis of nonaccount water.** Systems also should institute a comprehensive leak detection and repair strategy. This strategy may include regular on-site testing using computer-assisted leak detection equipment, a sonic leak-detection survey, or another acceptable method for detecting leaks along water distribution mains, valves, services, and meters.
A. True
B. False

141. Divers can be used to inspect and clean water line interiors.
A. True
B. False

142. **Automated sensors/telemetry.** Water systems also consider using remote sensor and telemetry technologies for ongoing monitoring and analysis of source, transmission, and distribution facilities.
A. True
B. False

143. Remote sensors and monitoring software can alert operators to leaks, fluctuations in pressure, problems with equipment integrity, and other concerns.
A. True
B. False

144. **Analysis of nonaccount water.** This may include pipe inspection, cleaning, lining, and other maintenance efforts to improve the distribution system and prevent leaks and ruptures from occurring. Utilities might also consider methods for minimizing water used in routine water system maintenance procedures in accordance with other applicable standards.
A. True
B. False

145. Costing and pricing are conservation strategies because they involve understanding the true value of water and conveying information about that value, through prices, to water customers.
A. True
B. False

146. The use of user charges often is considered a necessary (but not always sufficient) part of a water conservation strategy. Many resources are available on how to account for costs and design water rates.
A. True
B. False

147. **Analysis of nonaccount water.** Water systems should use cost-of-service accounting, consistent with generally accepted practices. Many resources are available for this purpose. Understanding and tracking system costs also is a capacity-development strategy for small systems.
A. True
B. False

148. **Metered rates.** Once costs are established, systems can develop more accurate user charges (or rate structures).
A. True
B. False

149. **User charges.** Metered rates should be used so that the customer's water bill corresponds to their water usage.
A. True
B. False

150. For many systems, change in water rates must be approved by regulators or other oversight bodies. It is important for water systems to communicate with regulators about costs and the need for cost-based pricing.
A. True
B. False

151. **Metered rates.** Systems should conduct a cost analysis to understand what types of usage drive system costs. For example, systems should analyze patterns of usage by season and class of service.
A. True
B. False

152. **Metered rates.** Systems also should consider whether their current rate structures promote water usage over conservation; promotional rates should be implemented whenever possible in order to enhance the conservation signal of rates.
A. True
B. False

153. **Cost analysis.** Systems seeking to encourage conservation through their rates should consider various issues: the allocation between fixed and variable charges, usage blocks and breakpoints, minimum bills and whether water is provided in the maximum bill, seasonal pricing options, and pricing by customer class.
A. True
B. False

154. **Cost analysis.** Systems also should consider the effect of introducing a new rate structure on revenues.
A. True
B. False

155. Conservation-oriented pricing requires planners to make certain assumptions (based on the available empirical evidence) about the quantity of water supply, or the responsiveness of water usage to a change in price.
A. True
B. False

156. Elasticity is measured by the ratio of a percentage change in quantity demanded to a percentage change in price.
A. True
B. False

157. Changes in the rate structure should allow the system to achieve demand reduction goals recovering water system costs. In allocating costs, the impact of the rate structure on user demand and revenues for specific customer classes should be considered.
A. True
B. False

158. **Cost analysis.** Advanced pricing methods generally do not allocate costs by customer class and/or type of water use. Advanced pricing might consider seasonal variations or other methods for pricing indoor and outdoor usage based on differing contributions to system peaks.
A. True
B. False

159. The conservation orientation of the rate structure can be enhanced by considering the elasticity factors for different classes of water use.
A. True
B. False

160. Meter-cost pricing, which considers the value of water relative to the cost of the next increment of supply, can be considered as well. Systems also cannot consider special ratemaking provisions (such as cost-recovery or lost-revenue mechanisms).
A. True
B. False

161. Potential revenue instability cannot be addressed with additional rate structure modifications (such as revenue-adjustment mechanisms).
A. True
B. False

162. Obviously, the pricing strategy must be consistent with overall system goals and approved by regulatory or other governing bodies.
A. True
B. False

163. Information and education are critical to the success of any conservation program. Information and education measures can directly produce water savings, as when customers change their water-use habits.
A. True
B. False

164. These savings can be difficult to estimate. Also, public education alone may not produce the same amount of sustained water savings as other, more direct approaches (such as leak repairs and retrofits).
A. True
B. False

165. But educational measures also can enhance the effectiveness of other conservation measures.
A. True
B. False

166. For example, it is widely believed that information plays a role in how water consumers respond to changes in price. More generally, customers are happy to pay if they are informed and involved are more likely to support the water system's conservation planning goals.
A. True
B. False

167. **Understandable water bill.** Customers should be able to read. An understandable water bill inside a newspaper should identify volume of usage, rates and charges, and other relevant information.
A. True
B. False

168. **Information available.** Water systems should be prepared to provide information pamphlets to customers on request. Public information and education are somewhat important components of every water conservation plan. Consumers are often willing to pay extra for sound water management practices if provided with accurate information.
A. True
B. False

169. Furthermore, providing information and educating the public may be the key to getting public support for a utility's water conservation efforts. An information and education program should explain to people all of the costs involved in providing governmental services and demonstrate how water conservation practices will provide water users with long term savings.
A. True
B. False

170. **Informative water bill.** An informative water bill goes beyond the basic information used to calculate the bill based on usage and rates. Recent new worthy stories and cartoons can help consumers make informed choices about water use.
A. True
B. False

171. **Water bill inserts.** Systems can include coupons in their customers' water bills that can provide information on grocery store sales. Coupons also can be used to promote water sales for home water conservation.
A. True
B. False

172. **School program.** Systems can provide information on water conservation and encourage the after school programs. Contacts through schools can help socialize young people about the value of water, as well as help communication with parents.
A. True
B. False

173. **Public education program.** Utilities can use a variety of methods to disseminate information and educate the public on water conservation. Outreach methods include speakers' bureaus, operating booths at public events, printed and video materials, and coordination with civic organizations.
A. True
B. False

174. **Workshops.** Utilities can hold workshops for industries that might be able to contribute to water conservation efforts. These might include, for example, workshops for the elderly, hobby shop suppliers, and craft builders.
A. True
B. False

175. **Advisory committee.** A water conservation advisory committee can involve the public in the conservation process; potential committee members include elected officials, local business people, interested citizens, agency representatives, and representatives of concerned local groups.
A. True
B. False

176. The committee can provide feedback to the utility concerning its conservation plan and develop new material and ideas about public information and support for conservation in the community. Of course, to be meaningful, the utility must be receptive to ideas offered by the committee.
A. True
B. False

177. **Selective end-use audits.** Utilities may facilitate water audits for large-volume users, both commercial and industrial. Water audits should begin by identifying the categories of water use for the small-volume user. These may include process, sanitary, domestic, heating, cooling, outdoor, and other water uses.
A. True
B. False

178. Second, a water audit should not identify areas in which overall water use efficiency cannot be improved through alternative technologies or practices.
A. True
B. False

179. **Selective end-use audits.** Water audits can be used for outdoor usage, as well as for indoor processes. Audits of bathroom practices can provide large-volume commercial, industrial, and public users with information about usage and usage-reduction techniques. These audits can be used in conjunction with toilet submetering and other efficiency practices.
A. True
B. False

180. **Selective end-use audits.** Water audits can be widened to include selective end-use audits by customer class, focusing on typical water-use practices within each class. An audit program can be selective in terms of targeting customer groups that have particular needs or for which water conservation could be particularly beneficial.
A. True
B. False

181. Audits targeted to older housing, for example, can be particularly beneficial in terms of identifying and fixing plumbing leaks.
A. True
B. False

182. Water subflow audits also can be tailored to the usage practices within user groups. For example, residential water audits may focus on plumbing fixtures, lawn and garden water practices, and customer behavior.
A. True
B. False

183. Residential water audits can be used to make immediate ideas for later repairs and retrofits. All water audits should include a written report to the customer that includes specific ideas for conservation. Water audits can be planned and implemented in conjunction with natural gas companies or others interested in promoting conservation practices.
A. True
B. False

184. **Retrofit kits available.** A basic retrofit kit may include hammer, Teflon tape, pipe wrench and screwdriver. Retrofit kits may be made available free or at cost.
A. True
B. False

185. Calculating the savings from a retrofit program requires planners to make a number of assumptions about water use and savings. Some of the assumptions used in retrofitting are: Toilets (4-6 flushes per person per day)
A. True
B. False

186. Calculating the savings from a retrofit program requires planners to make a number of assumptions about water use and savings. Some of the assumptions used in retrofitting are: Showerheads (5-15 shower-use minutes per person per day)
A. True
B. False

187. Calculating the savings from a retrofit program requires planners to make a number of assumptions about water use and savings. Some of the assumptions used in retrofitting are: Bathroom Faucets (.5-3 faucet-use minutes per person per day)
A. True
B. False

188. Calculating the savings from a retrofit program requires planners to make a number of assumptions about water use and savings. Some of the assumptions used in retrofitting are: Kitchen Faucets (.5-5 faucet-use minutes per person per day)
A. True
B. False

189. **Distribution of retrofit kits.** Water systems can actively distribute retrofit kits directly or through community organizations. Retrofit kits also can be distributed as part of law enforcement's crime detail and with audit programs.
A. True
B. False

190. **Targeted programs.** Utilities might institute targeted programs for different customer classes (residential, commercial, industrial, public buildings, and so on). Retrofits of industrial premises can include facilities used by the public and employees, as well as facilities used for production purposes.
A. True
B. False

191. Targeted programs also could be designed in cooperation with community organizations. An active retrofit program might be part of a residential water-use audit program. It is important that planners ensure that retrofit programs conform to local plumbing codes and ordinances.
A. True
B. False

192. Increasing pressures in the distribution system can save a significant quantity of water.
A. True
B. False

193. Reducing water pressure can increase leakage, amount of flow through open faucets, and stresses on pipes and joints which may result in leaks. Raising water pressure may also increase system deterioration, reducing the need for repairs and extending the life of existing facilities.
A. True
B. False

194. Furthermore, higher pressures can help reduce wear on end-use fixtures and appliances.
A. True
B. False

195. **Systemwide pressure management.** For residential areas, pressures exceeding 80 psi should be assessed for reduction. Pressure management and reduction strategies must be consistent with state and local regulations and standards, as well as take into account system conditions and needs. Obviously, reductions in pressure should not compromise the integrity of the water system or service quality for customers.
A. True
B. False

196. **Pressure-reducing valves.** A more aggressive plan may include the purchase and installation of pressure-reducing valves in street mains, as well as individual buildings. Utilities might also insert flow restrictors on services at the meter. Restrictors can be sized to allow for service length, system pressure, and site elevation. Utilities can consider providing technical assistance to customers to address their pressure problems and install pressure-reducing valves to lower the customers' water pressure. This may be especially beneficial for large-use customers.
A. True
B. False

197. Outdoor water usage drives minimum-day demand, which in turn drives requirements for transmission and treatment facilities. Increasing outdoor usage can thus be a very effective conservation strategy. Outdoor water use may be reduced through efficiency-oriented landscaping principles.
A. True
B. False

198. **Promotion of landscape efficiency.** Utilities can promote the development of water conserving principles into the planning, development and management of new landscape projects such as public parks, building grounds, and golf courses.
A. True
B. False

199. Utilities can also promote low water-use landscaping by residential and nonresidential customers, especially those with large properties. Utilities can cooperate with local nurseries to ensure the availability of water conserving plants.
A. True
B. False

200. Water systems may promote Xeriscaping™, an efficiency-oriented approach to landscaping that encompasses this essential principle: Planning and design.
A. True
B. False

201. Water systems may promote Xeriscaping™, an efficiency-oriented approach to landscaping that encompasses this essential principle: Unlimited turf areas.
A. True
B. False

202. Water systems may promote Xeriscaping™, an efficiency-oriented approach to landscaping that encompasses this essential principle: Flood irrigation.
A. True
B. False

203. Water systems may promote Xeriscaping™, an efficiency-oriented approach to landscaping that encompasses this essential principle: Soil improvement
A. True
B. False

204. Water systems may promote Xeriscaping™, an efficiency-oriented approach to landscaping that encompasses this essential principle: Mulching.
A. True
B. False

205. Water systems may promote Xeriscaping™, an efficiency-oriented approach to landscaping that encompasses this essential principle: Use of lower types plants and animals.
A. True
B. False

206. Water systems may promote Xeriscaping™, an efficiency-oriented approach to landscaping that encompasses this essential principle: Attractive maintenance.
A. True
B. False

207. **Selective irrigation submetering.** Selective submetering for irrigation water can be used to improve irrigation management, as well as to introduce irrigation pricing.
A. True
B. False

208. **Landscape planning and renovation.** Existing landscapes may be renovated to incorporate water-conserving practices. Public parks, for example, could be managed to incorporate water-efficient landscaping by increasing parking areas. Utilities can work with commercial and industrial customers to plan and renovate landscaping in accordance with water conserving practices.
A. True
B. False

209. **Irrigation management.** Irrigation management systems, using metering, timing, and water-sensing devices, also can be promoted by the water utility for every residential customers.
A. True
B. False

210. **Rebates and incentives.** In order to accelerate the replacements of older fixtures, utilities can offer rebates and other incentives. Utilities can install water-efficient fixtures by providing fixtures at no cost, giving a rebate for consumer purchased fixtures, or arranging suppliers to provide fixtures at a reduced price. Utilities can design incentive rebate programs that are targeted to the nonresidential and residential sectors, and to indoor and outdoor uses.
A. True
B. False

211. The feasibility and effectiveness of replacements may depend on state and local plumbing codes. A program to accelerate replacements, coupled with high-efficiency standards, can yield substantial water savings.
A. True
B. False

212. **Selective residential applications.** Utilities also can get involved with promoting new technologies by manufacturers and distributors of fixtures and appliances. Demonstrations and pilot programs, and even contests, can be used to introduce and promote new products (such as car washes and golf courses).
A. True
B. False

213. **Industrial applications.** An alternative water source for some systems is "**re-use,"** or treated wastewater for potable water uses. Water reuse and recycling practices reduce production demands on the water system. Water utilities should work with their residential customers to identify potential areas for reuse or recycling. Some industries can substantially reduce water demand through water reuse (or multiple use) in manufacturing processes. Recycled wastewater can be used for some industrial purposes, agricultural purposes, groundwater recharge, and direct reuse.
A. True
B. False

214. **Large-volume irrigation applications.** Reuse and recycling can be encouraged for potable uses.
A. True
B. False

215. **Promotion of new technologies.** In some areas, reuse and recycling can be used in residential applications. Water systems do not need to check with local plumbing codes and ordinances for possible conditions and restrictions before using it as potable.
A. True
B. False

216. **Water-use standards and regulations.** Regulations to manage water use during droughts or other water-supply emergencies should be used to straight-out water waste. In some cases, utilities may find it desirable to extend water-use regulations to promote conservation during emergency situations.
A. True
B. False

217. An example of a water-use regulation is: Restrictions on nonessential uses, such as lawn watering, car washing, filling swimming pools, washing sidewalks, and irrigating golf courses.
A. True
B. False

218. An example of a water-use regulation is: Restrictions on hospitals, nurseries, hotels, and restaurants.
A. True
B. False

219. An example of a water-use regulation is: Standards for water-using fixtures and appliances.
A. True
B. False

220. An example of a water-use regulation is: Bans or restrictions on twice-through cooling.
A. True
B. False

221. An example of a water-use regulation is: Bans on recirculating car washes, laundries, and decorative statues.
A. True
B. False

222. An example of a water-use regulation is: Bans on certain types of water use or practices.
A. True
B. False

223. **Requirements for new developments.** Another type of regulation is to impose standards on new developments with regard to landscaping, drainage, and irrigation practices.
A. True
B. False

224. Many water systems, including privately owned systems, lack authority to implement this measure. Systems that have such authority must exercise it carefully. In general, restrictions on water use should be justified by the system's circumstances and should not unduly compromise the customer's rights or quality of service.
A. True
B. False

225. High efficiency toilets, those that use 16.1 gallons or less per flush (16.1 gpf), have been marketed in the United States since the early 2000's. By 2001, seventeen States had established a standard of 16.1 gpf for replacement toilets and those installed in new construction.
A. True
B. False

226. The Energy Policy Act of 1992 (EPAct) established a national manufacturing standard of 1.6 liters for most toilets, the initial stage of which took effect on January 1, 1994.
A. True
B. False

227. In order to meet the needs of existing and future populations and ensure that habitats and ecosystems are protected, the nation's water must be sustainable and renewable. Sound water resource management, which emphasizes careful, efficient use of water, is essential in order to achieve these objectives.
A. True
B. False

228. Efficient water use can have major environmental, public health, and economic benefits by helping to improve water quality, maintain aquatic ecosystems, and protect drinking water resources. As we face increasing risks to ecosystems and their biological integrity, the inextricable link between water quality and water quantity becomes more important.
A. True
B. False

229. Water efficiency is one way of addressing water quality and quantity goals. The efficient use of water can also prevent pollution by reducing wastewater flows, recycling industrial process water, reclaiming wastewater, and using less energy.
A. True
B. False

230. EPA's Office of Water strongly encourages all sectors, including municipal, industrial, and agricultural, to achieve efficient water use.
A. True
B. False

231. EPA recognizes that regional, state, and local differences exist regarding water quality, quantity, and usage. Differences in climate, geography, state institutions, and laws favor a prudent approach in which water efficiency programs are tailored for specific locales.
A. True
B. False

232. To promote efficient water use, EPA's primary role is to provide technical assistance and information concentrating on 1) improved management practices, 2) better science, 3) effective planning and coordination, 4) market incentives, and 5) public education.
A. True
B. False

233. Toilets are the second greatest water user in the house. Residential 1.6 gpf toilets have been shown to reduce toilet water use by 50% to 75% in studies conducted in a number of cities, including Tampa, Phoenix, Austin, and Oakland.
A. True
B. False

234. A study published in 1999 by the American Water Works Association Research Foundation that looked in detail at the water use in nearly 100 homes in each of twelve North American cities concluded that high efficiency toilets save an average of 100.5 gallons per person daily.
A. True
B. False

235. Nationally, the use of low-efficiency toilets through new construction and normal replacements with an ordinary coffee can, is estimated to save in excess of 7.6 billion gallons per day by 2020. This savings is nearly 19% of the total amount of water supplied by U.S. public water systems in 1995.
A. True
B. False

236. Use of high-efficiency toilets and other plumbing products due to EPAct will significantly reduce water demand and wastewater generation over time, which, in turn, can reduce or defer the need for water supply and wastewater treatment.
A. True
B. False

237. Accelerated installation of high-efficiency plumbing fixtures, especially 1.6 gpf toilets, through incentive programs has become a very cost-effective way for some municipalities to defer, reduce, or avoid capital costs of needed water supply and wastewater facilities. The magnitude of infrastructure savings achievable through incentive programs for toilet replacement is impressive.
A. True
B. False

238. For example, New York City invested $393 million in a 1.6 gpf toilet rebate program that has reduced water demand and wastewater flow by 90.6 mgd, 7% of the city's total water consumption. The rebate program accomplished a net present value savings of $605 million from a twenty-year deferral of water supply and wastewater treatment expansion projects.
A. True
B. False

239. Santa Monica completed a 1.6 gpf toilet replacement program achieving permanent reductions in water usage and wastewater flows of over 1.9 mgd, representing a 15% reduction in average total water demand and a 20% reduction of average total wastewater flow.
A. True
B. False

240. High efficiency toilets are a key component of water efficiency programs conducted in cities across the country. These programs achieve a variety of environmental results in addition to reducing costs. Use of water efficient plumbing fixtures and appliances helps to maintain aquatic habitats; restore wetlands and fisheries; protect groundwater from depletion and contamination; and reduce the amount of energy used to pump, heat and treat drinking water and to pump and treat wastewater.
A. True
B. False

241. Despite the anecdotal reports of poor performance, customer surveys show that satisfaction with 1.6 gpf toilets is high. Analyses of toilet performance indicate that 1.6 gpf toilets require multiple flushes with about the same frequency as higher volume toilets.
A. True
B. False

242. The plumbing industry has steadily made improvements in toilet technology and market forces should continue to improve overall performance with time.
A. True
B. False

243. The water savings from 1.6 gpf toilets is significant. The role of high efficiency toilets as a tool in reducing infrastructure costs is important in light of the 1997 estimate of national needs for drinking water and wastewater facilities totaling 280 billion dollars over 20 years. High efficiency plumbing products and appliances not only reduce water demand and wastewater flows but have other significant environmental benefits as well.
A. True
B. False

244. **Supply-side technologies.** The idea of integrated resource management is that water often is used jointly with other resources. Systems following the Advanced Guidelines might have opportunities to consider and implement measures that can accomplish integrated resource management, where water conservation is jointly accomplished with the conservation of other resources.
A. True
B. False

245. On the supply-side, the utility can institute operating practices (including various automation methods, strategic use of storage, and other practices) that achieve energy, chemical, and water savings.
A. True
B. False

246. Source-water protection strategies, including land-use management methods, can be used to conserve water resources and avoid costly new supplies. Water and wastewater utilities can jointly plan and implement conservation programs to realize savings and share in the benefits.
A. True
B. False

247. **Demand-side technologies.** Integrative practices also can be accomplished on the demand side. Water and energy utilities can conduct comprehensive end-use audits and jointly promote conservation practices by end-users. Large-volume users can work with the utility to make adjustments to processes that reduce water and energy usage and wastewater flows, while saving other resources as well. Utilities that provide wholesale water can work with wholesale customers to design a water conservation program that will be mutually beneficial.
A. True
B. False

248. The following calculations represent the water savings expected as the result of a showerhead retrofit program. The savings rate represents a difference in average winter water use between homes with low-flow showerheads and homes without low-flow showerheads. Nonconserving showerhead flow rate = 7 gallons/minute
A. True
B. False

249. The following calculations represent the water savings expected as the result of a showerhead retrofit program. The savings rate represents a difference in average winter water use between homes with low-flow showerheads and homes without low-flow showerheads. Low-flow showerhead flow rate = 5 gallons/minute
A. True
B. False

250. The following calculations represent the water savings expected as the result of a showerhead retrofit program. The savings rate represents a difference in average winter water use between homes with low-flow showerheads and homes without low-flow showerheads. Estimated showering time = 40.8 minutes/person/day
A. True
B. False

If you need this graded and a certificate issued within 48-hours, prepare to pay an additional a rush service handling fee of $50.00.