

TEST BOOKLET
BOC 2004 – Water Efficiency for Building Operators
Edition 2.00

TEST INSTRUCTIONS

A period of one hour is available for the test, but it will not be strictly timed. This is an open book test. You may use any notes or handout materials of your own. Mark all answers *only* on the ANSWER SHEET. Make *no marks* in the TEST BOOKLET.

For true or false questions, make your choice by circling the corresponding letter on the ANSWER SHEET: “A” for True or “B” for False.

For multiple choice questions, *make only one choice* by circling the corresponding letter on the ANSWER SHEET. Where it appears that two answers may be correct, choose the one *better* answer. There are no questions that require the circling of more than one choice.

For questions of the matching type, write in the numbers that correspond to the answers on the blanks on the ANSWER SHEET. Each number should be used only once; in other words, once you have used a number in a blank, it shouldn't be used in another blank.

Here's a sample question:

Example: In the past, asbestos fibers were commonly used in numerous building materials, including which of the following:

- A. Pipe Insulation
- B. Furnishings
- C. Window coverings, such as drapes
- D. All of the above.

While all three could have contained asbestos, it was *commonly used* in only one of these: pipe insulation. The answer should be marked by drawing a circle around letter “A” on the ANSWER SHEET.

(Note: In the preceding example question, only pipe insulation was included as a material that commonly contained asbestos. That *does not mean* that *only* pipe insulation contained asbestos. It should be understood that the items covered in this test have been chosen to *sample* the operator's knowledge.)

BEGINNING OF TEST

Mark all answers on *only* the ANSWER SHEET. Make *no* marks in the TEST BOOKLET.

- 1. How can a graph of water usage in your facility over a two-year period help to save water?**
 - A. Identify unexplained winter spikes in usage attributed to leaks
 - B. Compare water use and water waste over time
 - C. Identify the best toilet to purchase for your building
 - D. A and B

- 2. What is a general goal of water conservation covered in the text?**
 - A. Reduce the demand for water
 - B. Improve efficiency in use and reduce losses and waste of water
 - C. Improve land management practices to conserve water
 - D. All of the above

- 3. How do federal, state and industry standards address water efficiency?**
 - A. Water-use standards were established for equipment to rate efficiency.
 - B. Federal codes regulate water fixtures in public settings.
 - C. States have adopted mandatory industry standards for water fixtures.
 - D. All of the above

- 4. Significant energy use associated with water is attributed to_____.**
 - A. Pumping
 - B. Treatment
 - C. Heating
 - D. All of the above

- 5. Before looking at equipment and pipes, what two things can you look at to see if you might have a leak?**
 - A. Water meter
 - B. Water use of the business across the street
 - C. Water bills
 - D. A and C

- 6. Assuming the utility allows it, how is a deduct meter used to reduce water use costs?**
 - A. Reduces the rate the utility charges per gallon
 - B. Deducts most of the wastewater generation from the wastewater bill
 - C. Deducts water from a bill that is used from greywater
 - D. Deducts all the measured water use that does not get discharged to the sewer from the wastewater bill

- 7. Which statement most accurately provides the definition of a facility water audit?**
 - A. Analysis of the distribution system and leak detection
 - B. Analysis of water-using systems, equipment and processes
 - C. Quantitative analysis of water billing history and service fees
 - D. Estimate of potential future water and wastewater rate escalation

- 8. Which statement best describes a water balance?**
- A. Summarizes opportunities and compares cost-effective measures for managing water reduction
 - B. An assessment of major water-using fixtures, equipment, systems and processes to estimate water use and system losses
 - C. The defined scope of the water use assessment
 - D. Provides a comparison of end-use to water supply and ultimate discharge of wastewater recorded in the billing history
- 9. Which type of equipment could be a major water end-use in a commercial or institutional building?**
- A. Cooling tower
 - B. Lavatory fixtures
 - C. Irrigation
 - D. All of the above
- 10. Which statement is true about flushometers?**
- A. They use a pressure assisted gravity tank to achieve a higher flush velocity.
 - B. A flushometer is a sensor that automatically flushes the toilet when appropriate.
 - C. They typically use either a diaphragm or a piston to control the flush.
 - D. Retrofitting with a water displacement product is a good strategy for reducing their consumption.
- 11. When looking to retrofit an existing public lavatory faucet to increase water efficiency, what should you consider?**
- A. Ability to replace the aerator
 - B. System pressure
 - C. Current flow rate standard
 - D. All of the above
- 12. To minimize water use, how should blowdown be controlled?**
- A. With a conductivity meter set to maximize the cycles of concentration without sacrificing water health and safety or proper equipment maintenance
 - B. By opening the blowdown valve for 5 seconds every week
 - C. By looking at the water in the tower and carrying out blowdown if it looks like it needs it
 - D. None of the above
- 13. On equipment cooled by a single pass of water, what two things should you check to look for water savings?**
- A. Run cooling water when equipment is on and adjust quantity of water to cooling load
 - B. Increase flow rates and ensure steady uninterrupted operation
 - C. Turn on cooling water at night and off during the day
 - D. B and C

14. Where do some steam systems have losses?

- A. Return lines
- B. Steam traps and steam lines
- C. Cooling equipment
- D. A and C

15. Select the statement that accurately describes a stormwater management strategy.

- A. Soil tightly compacted to support a sidewalk
- B. Increased paved surfaces and run-off directed toward sewer systems
- C. Permeable concrete installed near parking lot trees
- D. None of the above

16. What are possible water-use applications for harvested rainwater?

- A. Toilets
- B. Irrigation
- C. Laboratory processes
- D. A and B

17. Which statement accurately explains life cycle cost analysis?

- A. Cost effectiveness of equipment that weighs all associated costs and savings over time
- B. Water, wastewater and ancillary costs of water-consuming equipment, such as energy, O&M and chemicals
- C. Estimated useful life of equipment expressed in years
- D. Embedded energy savings over the lifetime of a water using system

18. Which of the following is a factor in irrigation system consumption?

- A. Integrity of equipment
- B. Quality of the soil
- C. The types of plants in the landscape
- D. All of the above

19. Which of the following is true about urinals?

- A. Non-water urinals are often the best choice because they require very little maintenance.
- B. Automatic sensors save water with every flush.
- C. There is very little difference between standard and continuous flush urinals.
- D. None of the above

20. Which major water-using system can be monitored for water efficiency using a submeter?

- A. Cooling towers
- B. Irrigation systems
- C. Boilers
- D. All of the above

END OF TEST

Please return the Test Booklet and your Answer Sheet to the administrator.