

TEST BOOKLET
BOC 2014 – Enhanced Automation and
Demand Reduction for Building Operators
Edition 1.00

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
EDITION 1.0**

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

- 1. Enhanced Automation technologies are systems that are installed in a building to help building personnel better manage the energy use in their facility and improve the comfort of occupants.**

 - A. True
 - B. False

- 2. Which type of system is usually associated with a platform that communicates with internal and external signals of a building, including electricity prices, weather conditions and power quality?**

 - A. Energy Management Systems (EMS)
 - B. Energy Information Systems (EIS)
 - C. Energy Transfer Systems (ETS)
 - D. Energy Management Interface (EMi)

- 3. Which term best describes a strategy used to reduce demand by moving building operations to times when price signals indicate less costly consumption?**

 - A. Load shifting
 - B. Load increasing
 - C. Peak usage
 - D. Peak elimination

- 4. Duty-cycling optimization**

 - A. can be a type of demand limiting strategy.
 - B. can be a type of demand response strategy.
 - C. starts and stops equipment that normally runs continuously.
 - D. All of the above.

- 5. One way to implement enhanced automation in your building is to remove monitoring and control points associated with your existing system.**

 - A. True
 - B. False

6. **Energy Management Systems and Energy Information Systems actually monitor the same system information.**
- A. True
 - B. False
7. **A specific task that Enhanced Automation can be used to accomplish is to:**
- A. replace defective HVAC equipment.
 - B. meet energy code time and temperature control requirements.
 - C. reset run-down timers.
 - D. monitor and analyze your energy use.
8. **What measure is typically not considered Enhanced Automation for demand response?**
- A. Demand response ventilation
 - B. HVAC time and temperature controls
 - C. Lighting sweep strategies
 - D. Demand limiting controls
9. **Demand-responsive ventilation is typically applied in conjunction with advanced controls such as direct digital control EMS. One type of control for demand-responsive ventilation is a _____.**
- A. humidity sensing system
 - B. temperature sensing system
 - C. carbon dioxide sensing system
 - D. pressure sensing system
10. **What type of system employs refrigeration equipment to make cold water or ice during non-peak hours, then uses the water or ice to provide cooling during on-peak hours?**
- A. Thermal Energy Storage
 - B. Refrigeration Bypass System
 - C. Ice Machines
 - D. Chilled Water System
11. **Building Automation Systems (BAS) are somewhat different from Energy Management Systems (EMS). Which feature is typically found only in a BAS system?**
- A. Load shedding functions
 - B. Facility data analysis
 - C. Optimum start/stop control
 - D. Facility environmental conditioning

12. Which type of EMS technology is the most common currently being used?
- A. Pneumatic controls
 - B. Electric controls
 - C. Direct digital control
 - D. Electronic controls
13. A rule of thumb for EMS Installation costs is _____ per square foot.
- A. \$0.50 to \$1.00
 - B. \$1.00 to \$3.00
 - C. \$3.00 to \$5.00
 - D. \$5.00 to \$7.00
14. Another method for estimating the cost of EMS systems is by “cost per point,” where a point refers to any controller or sensor signal connected to the EMS. As a rule, (and cautiously) the average cost per point is _____.
- A. \$500
 - B. \$1,000
 - C. \$1,500
 - D. \$2,000
15. An existing EMS system that is considered “ripe” for replacement is one that is over ____ years old.
- A. 12
 - B. 10
 - C. 14
 - D. 8
16. An Energy Information System can operate independently of an Energy Management System and can access information system-wide and across multiple buildings.
- A. True
 - B. False
17. When end users participate in a typical demand response program, they _____.
- A. pay the utility company for curtailing energy use
 - B. receive incentives for curtailing energy use
 - C. do not receive incentives for curtailing energy use
 - D. are asked to load shed only after a blackout

18. Which type of information is provided by an EIS?
- A. Energy use
 - B. Real-time prices
 - C. Weather forecasts
 - D. All of the above
19. In demand response, which is the best approach for shedding load?
- A. Dim lights
 - B. Increase ventilation
 - C. Install LED lamps
 - D. Override the EMS
20. Which demand response strategy does not need human intervention?
- A. Manual
 - B. Semi-automated
 - C. Direct
 - D. Automated

END OF TEST

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