EXAM BOOKLET
BOC 2003 Ed. 1.00 – Introduction to Building Commissioning

INSTRUCTIONS FOR THE EXAM

A period of 1 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 on only 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 best 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.

Follow through the following sample questions:

Example #1:
Electric motors typically have an efficiency of approximately 95% to 99%.
A. True
B. False

The correct choice is "False". Your choice should be marked by drawing a circle around letter "B" on the ANSWER SHEET.

(Note: Standard motors are approximately 78% to 93% efficient, depending on size. High efficiency electric motors can have very high efficiencies, but even these special motors exceed 95% in only very large sizes. While there are special motors that can exceed 95%, the statement given in this example question is not substantially true; therefore, it should be marked as false.)

Example #2:
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 would have been 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 examination 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. According to ASHRAE Guideline 0, commissioning is:

    a. A quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria.

    b. A costly way to verify that building systems work.

    c. A testing and balancing report.

    d. All of the above.

2. The retrocommissioning process goes beyond typical tune-up activities by

    a. Optimizing how equipment and systems function together.

    b. Calibrating temperature sensors.

    c. Performing a boiler efficiency test.

    d. All of the above.

3. Which of the following sequences demonstrates the order in which tests occur in the bottom-up approach to testing?

    a. Equipment, component, system, and then interactions.

    b. Component, equipment, system, and then interactions.

    c. Interactions, system, equipment, and then components.

    d. System, interactions, equipment, and then components.

4. Retrocommissioning is appropriate for keeping building systems going that are close to the end their life.

    a. True

    b. False

5. What is/are the key element(s) that influence the cost of commissioning for both new and existing buildings?

    a. Building size.

    b. Complexity of the building systems.

    c. Scope of services

    d. All of the above.

6. Retrocommissioning project costs can be reduced by O&M staff performing which of the following tasks:

    a. Reducing boiler temperature during heating season.

    b. Turning up the thermostat on hot days.

    c. Performing appropriate preventive maintenance tasks and minor repairs prior to beginning a retrocommissioning project.

    d. All of the above.

7. A retrocommissioning project has been approved for your facility, however the approved budget is $5000 less than the least expensive third party provider's fee proposal. What can be done to bring the fee proposal and the approved budget in line with each other?

    a. Leave out testing the Building Automation System.

    b. Schedule the project so it falls into two fiscal years and hope your boss can pick up the $5000 in your O&M budget.

    c. The O&M staff can assist with the project by compiling the building documentation, performing preventative maintenance tasks, checking the calibration of critical sensors, and dedicating a staff person 2 days a week to assist during testing.

    d. All of the above.

8. A scoping study is a low-investment approach for determining whether retrocommissioning is appropriate for a particular facility.
    a. True
    b. False

9. The primary deliverable and decision-making tool of a retrocommissioning project is:

    a. A Master List of Findings and Recommendations

    b. An Equipment List

    c. A Trending Plan

    d. None of the above

10. Having the Commissioning Provider perform a cost / benefit analysis on the most significant findings helps the owner decide

    a. How to fix everything on the "Master List"

    b. Which season is best for performing repairs

    c. Which improvements are most cost effective to implement first

    d. All of the above

11. Recommissioning is performed after a building has been commissioned or retrocommissioned in order to ensure that equipment and systems continue to perform according to original intent.

    a. True

    b. False

12. Major energy wasters that are commonly found in retro-commissioning include

    a. Equipment running more than needed

    b. Cooling or heating air more than needed

    c. Heating and cooling at the same time

    d. All of the above

END OF TEST

Please return the test to the administrator.