

TEST BOOKLET
BOC 2012 – Advanced Electrical Diagnostics
Edition 1.00

TEST INSTRUCTIONS

The BOC 202 test consist of 20 multiple choice questions. 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 only on the ANSWER SHEET. Make no marks in the TEST BOOKLET.

Select only one answer 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.

Below are some sample questions:

Example #1: Electric motors typically have an efficiency of approximately.

- A. 95% to 99%
- B. 78% to 93%
- C. 50% to 75%
- D. 40% to 48%

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 specialized motors that can exceed 95%, this is not typical. The answer should be marked by drawing a circle around letter “B” on the ANSWER SHEET.

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 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. **Electrical monitoring requires which of the following considerations:**
 - A. An understanding of the electrical parameters to be monitored.
 - B. An understanding of the time interval setup characteristics of the monitor.
 - C. The environment occurring in the space being monitored.
 - D. All of the above.

2. **What is the most common wiring problem in a building electrical system?**
 - A. Illegal neutral to ground bonds.
 - B. Loose or open connections.
 - C. Neutral to ground bonds.
 - D. Faulty breakers.

3. **Utility revenue meters are a new way to obtain information about a facility. Which of the following is true?**
 - A. Revenue meters are very accurate.
 - B. Some models include power factor and power quality measurement capabilities.
 - C. They are employed at the utility service entrance or at submetering points in the facility.
 - D. All of the above.

4. **Always use True Root Mean Square electrical meters because TRMS meters:**
 - A. Are more accurate than revenue meters.
 - B. Are all rated at CAT 4 or greater.
 - C. Are up to 40% more accurate.
 - D. Are easier to use than average reading meters

5. **What are the primary causes of voltage surges?**
 - A. Lightning, utility switching and customer load and inrush.
 - B. Lions, tigers and bears (oh my).
 - C. Wind, rain and tornados.
 - D. None of the above.

6. **As a rule of thumb, how much oversizing of a given load should a UPS be designed for?**
 - A. 20%
 - B. 30%
 - C. 40%
 - D. 100%

7. **Predictive Maintenance offers which one of the following advantages:**
- A. The ability to predict equipment failures.
 - B. The energy rating in Joules of electrical equipment.
 - C. The Basic Lightning Impulse Level (BLIL) of equipment.
 - D. Cost savings due to running equipment until fails.
8. **Which statement is TRUE of a circuit that has harmonics distortions:**
- A. The voltage harmonic distortion is allowed to exceed 5%.
 - B. The 5th harmonics rarely cancel out.
 - C. Harmonic distortions only occur in the voltage sine wave.
 - D. Harmonic distortions take only a fraction of a second to destroy electronic equipment.
9. **The preferred level of Power Factor is between what levels?**
- A. 0.1 and 0.3
 - B. 0.8 and 1.0
 - C. 0.5 and 0.6
 - D. none of the above.
10. **IR scanners are particularly useful in determining which of the following:**
- A. Heat loss
 - B. Loose connections
 - C. Damaged equipment
 - D. All of the above.
11. **A comprehensive maintenance plan for a diesel engine-generator systems should consist of the following testing periods (as recommended by most manufacturers):**
- A. Weekly, Monthly, Quarterly, Annually.
 - B. Daily, Weekly, Monthly, Quarterly.
 - C. Monthly and Annually.
 - D. Annually.
12. **Types of long term and specialty meters used by facility operators include:**
- A. ground system testers.
 - B. insulation meters.
 - C. lighting level meters.
 - D. All of the above.

13. **A PLC is sensitive to which of the following:**
- A. Proper programming.
 - B. Voltage levels.
 - C. Temperature.
 - D. All of the above.
14. **A high speed Automatic Transfer Switch (ATS) is rated for what transfer speed:**
- A. 1 hour.
 - B. 30 seconds.
 - C. ¼ Hertz.
 - D. 3 days.
15. **VRLA stands for what type of battery?**
- A. Voltage Regulated Linear Assisted battery.
 - B. Voltage Rated Linear Actuated battery.
 - C. Valve Regulated Lead Acid battery.
 - D. None of the above.
16. **Most motors fail as a result of:**
- A. Faulty wiring or breakers.
 - B. Overheating or harmonics on the same circuit.
 - C. Customer load switching and inrush current.
 - D. Lack of proper lubrication
17. **What are the primary functions of switchgear?**
- A. A new way to obtain information about a facility such as overheating.
 - B. Monitor and correct harmonic distortion in circuits.
 - C. House metering, protective relaying and circuit breakers and fuses.
 - D. Measure Basic Lightning Impulse Level (BLIL) of equipment.
18. **Current imbalance in a 3-phase induction motor can be caused by:**
- A. C. and D.
 - B. excessive bearing lubrication.
 - C. small voltage unbalance.
 - D. internal motor damage.

19. Which of the following items are prime candidates for Energy Conservation based improvements in a facility?
- A. Replacing old lighting systems.
 - B. Replacing old motors.
 - C. Replacing old transformers.
 - D. All of the above.
20. Which of the following statements is NOT true regarding Data Centers:
- A. Data centers have control wiring that may be difficult to understand.
 - B. Data Center upgrades are normally easily accommodated.
 - C. Data Centers may have unique operating problems.
 - D. Data Centers require a great deal of maintenance.

END OF TEST

Please return the TEST BOOKLET and your ANSWER SHEET to the administrator.