TEST BOOKLET
BOC 1007 – Facility Electrical Systems
Edition 2.10

TEST INSTRUCTIONS

The BOC 1007 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
EDITION 2.10

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

1. **What can happen when the human body comes in contact with an electrical current?**
   A. Impairment of breathing or respiratory arrest.
   B. Trauma to the brain and nervous system.
   C. Heart failure or heart muscle spasms.
   D. All of the above.

2. **Voltage is best described as the force that _____.**
   A. Decreases electrical resistance.
   B. Increases electrical resistance.
   C. Pushes electrons through a circuit.
   D. Causes heat to dissipate in electronics.

3. **What are the basic components of an electrical circuit?**
   A. A wire, a switch, and a battery
   B. A wire, a lamp and a fuse
   C. A voltage source, a pathway and a load
   D. A transformer, a circuit breaker, and a load.

4. **A short circuit is _____.**
   A. An electrical pathway with little or no voltage.
   B. An electrical pathway offering little or no resistance.
   C. A break in the circuit.
   D. The shortest path of a closed circuit.

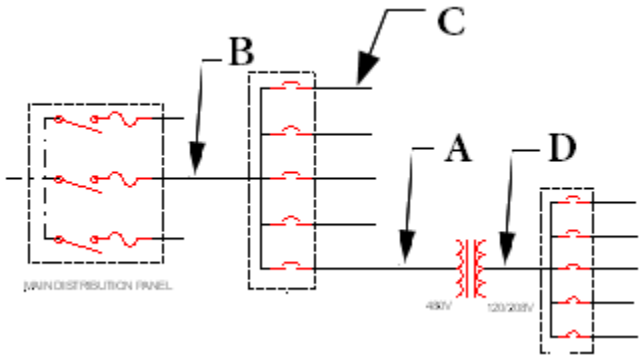
5. **During a routine walk-through inspection, an operator observed that a motor serving a boiler feedwater pump was vibrating and running hot. These symptoms could indicate possible motor inefficiencies related to:**
   A. Low-quality electrical power
   B. Adverse environmental conditions
   C. Ineffective or insufficient maintenance
   D. All of the above

6. **What is the primary purpose of a fuse or circuit breaker?**
    A. Regulates current to devices and motors.
    B. Controls voltages to ensure power quality and prevent damage from high or low voltage.
    C. Protects conductors and devices from overheating due to excess amperage.
    D. Provides a switching mechanism for large horsepower motors.

7. **What is a ground circuit?**
    A. A low resistance pathway for current to flow around a load
    B. A high resistance pathway for current to flow to a loop
    C. A low resistance pathway for current to flow to building ground
    D. A high resistance pathway for current to flow to a splitter

8. **The purpose of a ground circuit is to safely prevent _____.**
    A. Overheating
    B. Electrical shock
    C. High voltage
    D. Harmonic distortion

9. **What does a transformer do?**
    A. Raises or lowers AC voltages
    B. Maintains stable voltages on branch circuits
    C. Transforms voltage wave signatures
    D. Dampens voltage surges.



10. In the drawing above, select the correct letter identifying a branch circuit?

A.

B.

C.

D.

11. What can happen if too many appliances are plugged into outlets on the same parallel circuit?

A. Increased load in the circuit will increase voltage and cause the breaker to trip.

B. Increased load in the circuit will decrease resistance and increase amperage and cause the breaker to trip.

C. Voltage will decrease resulting in an increase in current and cause the breaker to trip.

D. Resistance in the circuit will increase resulting in a decrease of amperage in the circuit.

12. Which of the following is a characteristic of a Parallel Circuit?

A. There is more than one pathway or branch through the whole circuit.

B. A light switch and the light it controls are connected in parallel.

C. An opening anywhere in the circuit de-energizes the whole circuit.

D. The current is constant and the voltage and resistance is additive.

13. A branch circuit is a power distribution pathway from the _____.

A. power vault to a distribution panel

B. distribution panel to a low voltage panels

C. last circuit breaker to a motor or lights

D. substation to a fused distribution switch

14. The term "power factor" refers to the _____.

A. Voltage and current supplied to the inductive circuit.
B. True power consumed by the facility.
C. Apparent power stored in the magnetic field.
D. A ratio of true power to apparent power.

15. A motor operating below normal operating range may result in a decrease in _____.

A. Operating costs
B. Efficiency and motor life
C. Utility bill power factor charges
D. Unscheduled maintenance

16. What could be wrong with a set of contacts that showed a voltage drop when closed?

A. Bent
B. Pitted or corroded
C. Wet
D. Fused together

17. Using Ohm's Law, calculate the Watts used by a fluorescent ballast with the following nameplate information: Line Amps = 0.50; Volts = 120.

A. 60 watts
B. 55 watts
C. 120 watts
D. 240 watts

18. Using Ohm's Law, calculate the amps used by a 750-watt electric resistance heater if the voltage is 120V.

A. 12.5 amps
B. 6.25 amps
C. 7.5 amps
D. 10.0 amps

19. Using Ohm's Law, calculate the resistance of a 300 Watt lamp in a 120 volt circuit with 2.5 amps of current flowing through it.

A. 48 ohms
B. 125 ohms
C. 288 ohms
D. 720 ohms

20. A _____ starts a three-phase motor.

A. Direct electric current
B. Current supplied to rotating coils
C. Low voltage generator
D. A Rotating magnetic field

End of TEST

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