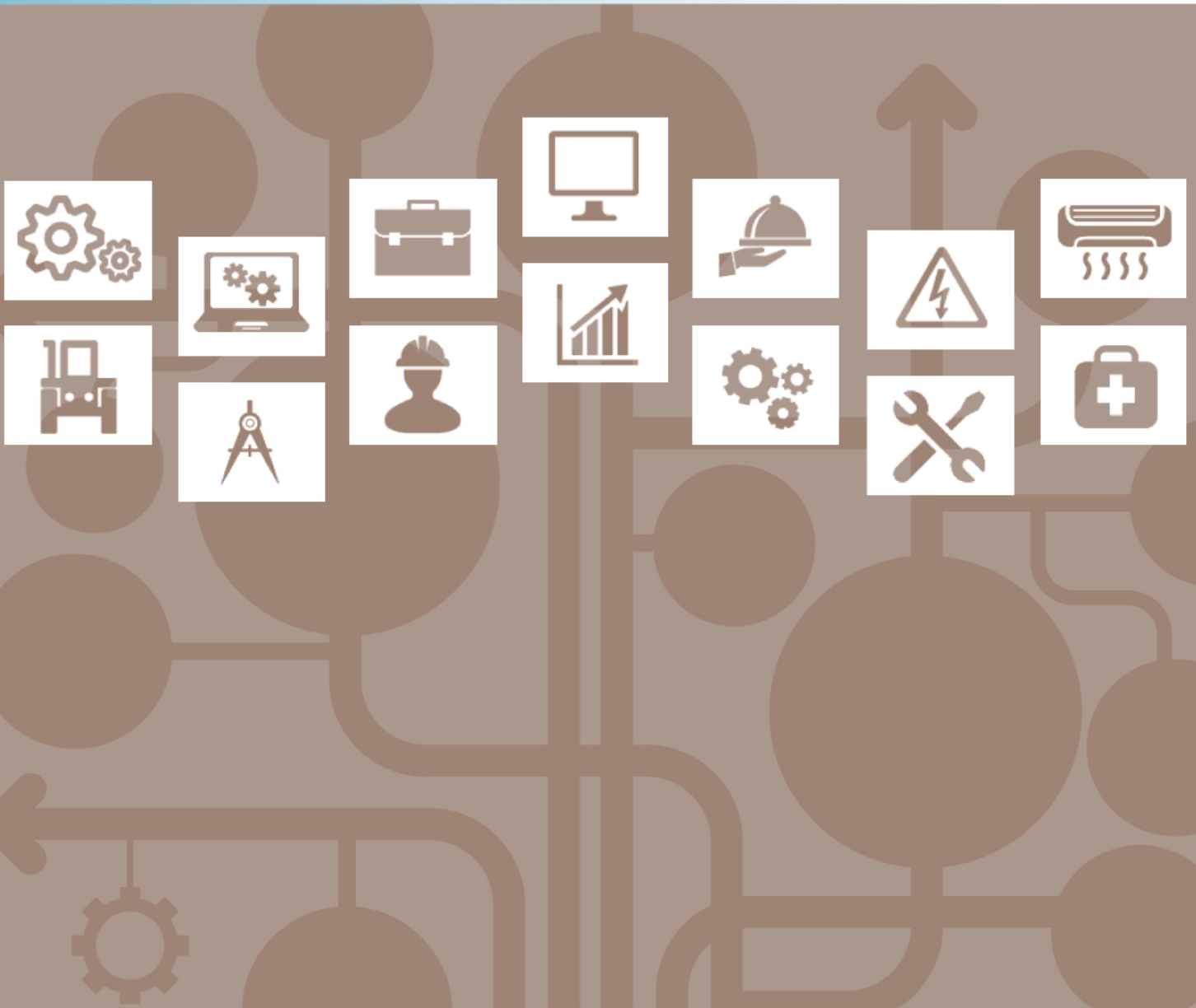


Entry Level Assessment Blueprint

Electrical Construction Technology



Specific Competencies and Skills Tested in this Assessment:

Introduction to the Electrical Construction Technology Career

- Identify various electrical construction technology positions and responsibilities
- Identify career-related professional organizations and their purpose

OSHA Regulations and Electrical Safety Practices

- Identify proper use of personal protective equipment (PPEs) according to NFPA 70E standards
- Explain the purpose of OSHA
- Identify procedures for fire, ladder, and environmental safety according to OSHA standards
- Identify procedures for lock-out/tag-out
- Explain basic first aid procedures

Meters, Measurements, Testing

- Identify characteristics, uses and connections of meters and measuring devices
- Identify meter safety procedures
- Interpret meter readings



Identification and Selection of Tools, Materials, and Components

- Identify and correctly use hand and power tools
- Identify and select proper conductor cable type
- Identify and select proper conduit, boxes, and fittings
- Identify the function and purpose of various specialty equipment, including Ground Fault Circuit Interrupter (GFCI), Arc-Fault Circuit Interrupter (AFCI)
- Identify commonly used listed and labeled equipment (UL or CSA)

Blueprints, Specifications, and Estimations

- Identify and interpret electrical symbols and specifications in blueprints and plan symbols
- Identify and interpret wiring and schematic diagrams
- Demonstrate planning and layout of a circuit

Specific Competencies and Skills continued:**AC/DC Theory**

- Identify characteristics of AC circuits
- Explain amperage, power, voltage, and resistance
- Identify materials as insulators, conductors, and semi-conductors
- Identify characteristics and components of DC circuits

Circuit Theorems and Conversions

- Identify and apply various circuit theorems, including Ohm's Law, Watt's Law, and electron theory
- Identify and apply various mathematical conversions, including scientific, engineering, and notations/conversions (milliamps to amps; kilowatts to horsepower)

Wiring, Circuits, and Installation

- Explain the NEC and how it is organized
- Select appropriate wiring for specific installations (residential and commercial)
- Install various switching arrangements
- Install cabling, raceways, conduit, boxes, wiring, devices, and trims
- Test and troubleshoot completed installation

**Green and Renewable Technology**

- Discuss wind turbine, solar energy, and other renewable sources of energy
- Describe energy management devices (e.g., LED lighting, CFLs, occupancy sensors)

Transformers

- Identify and calculate voltage/current for primary and secondary windings
- Determine KVA capacity of a single-phase and three-phase transformer
- Differentiate between Delta and Wye connections

Specific Competencies and Skills continued

Motors

- Describe operating characteristics of basic single-phase and three-phase induction motors
- Identify and connect motor connections per nameplate (three-phase and single-phase)
- Identify and interpret motor nameplate information (e.g., voltage and phases)

Motor Controls

- Explain basic operation of circuitry
- Test, troubleshoot, and reverse three-phase motor rotation
- Identify commonly used symbols in motor controls

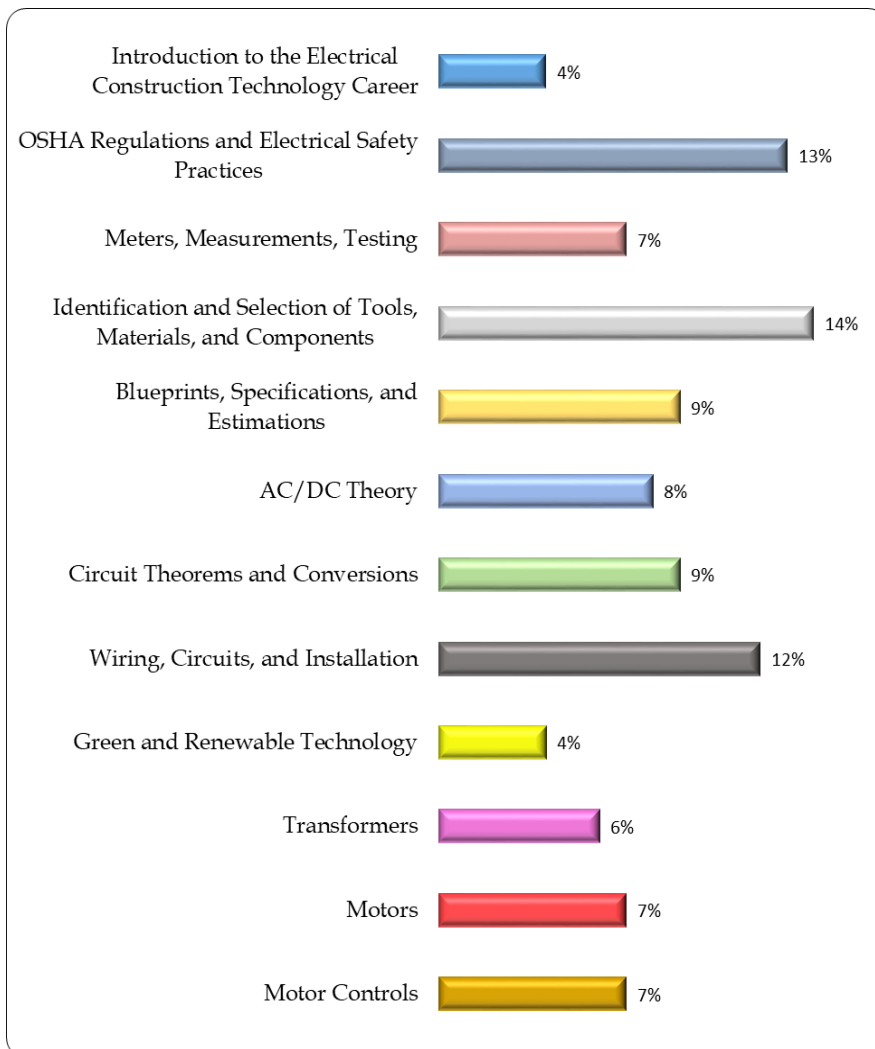
Written Assessment:

Administration Time: 3 hours

Number of Questions: 174

Areas Covered:

4%	Introduction to the Electrical Construction Technology Career
13%	OSHA Regulations and Electrical Safety Practices
7%	Meters, Measurements, Testing
14%	Identification and Selection of Tools, Materials, and Components
9%	Blueprints, Specifications, and Estimations
8%	AC/DC Theory
9%	Circuit Theorems and Conversions
12%	Wiring, Circuits, and Installation
4%	Green and Renewable Technology
6%	Transformers
7%	Motors
7%	Motor Controls



Sample Questions:

An apprentice electrician should

- A. be supervised while on the job site
- B. be pre-qualified to operate hand tools
- C. hold a journeyman license
- D. pass local standards electrical test

A ladder may be used in front of a door only if

- A. no one is at home
- B. no glass is present
- C. the door is locked or blocked
- D. it is the last fixture to hang

Measure electromotive force with a/an

- A. cosine
- B. full
- C. half
- D. sinusoidal

The symbol normally used for a single receptacle is a

- A. circle with two parallel lines drawn through it
- B. circle with one line drawn through it
- C. square box with an X drawn inside
- D. square box with the letter R next to it

The AC voltage waveform is called a _____ wave.

- A. cosine
- B. full
- C. half
- D. sine

Performance Assessment:

Administration Time: 3 hours and 20 minutes

Number of Jobs: 3

Areas Covered:

34% Bend Conduit

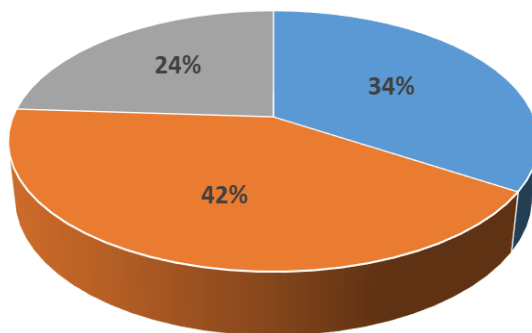
Participant will safely install boxes onto the wall, and use proper bending and cutting techniques to install conduit.

42% Switching and GFCI Receptacle in a Residential Setting

Participant will properly mount boxes, install wiring and devices, and complete the job in a neat operational manner following safety standards.

24% Install Two Smoke Alarms in a Commercial Setting

Participant will install interconnected components to operate properly following safety standards.



Sample Job:	Install Two Smoke Alarms in a Commercial Setting
Maximum Time:	1 hour
Participant Activity:	The participant will install two smoke alarms in a commercial setting referring to the drawings provided, using MC 14-2 and 14-3 AWG, install two interconnected smoke alarms, use a separate circuit, and home run first smoke alarm; interconnect between the two smoke alarms.

