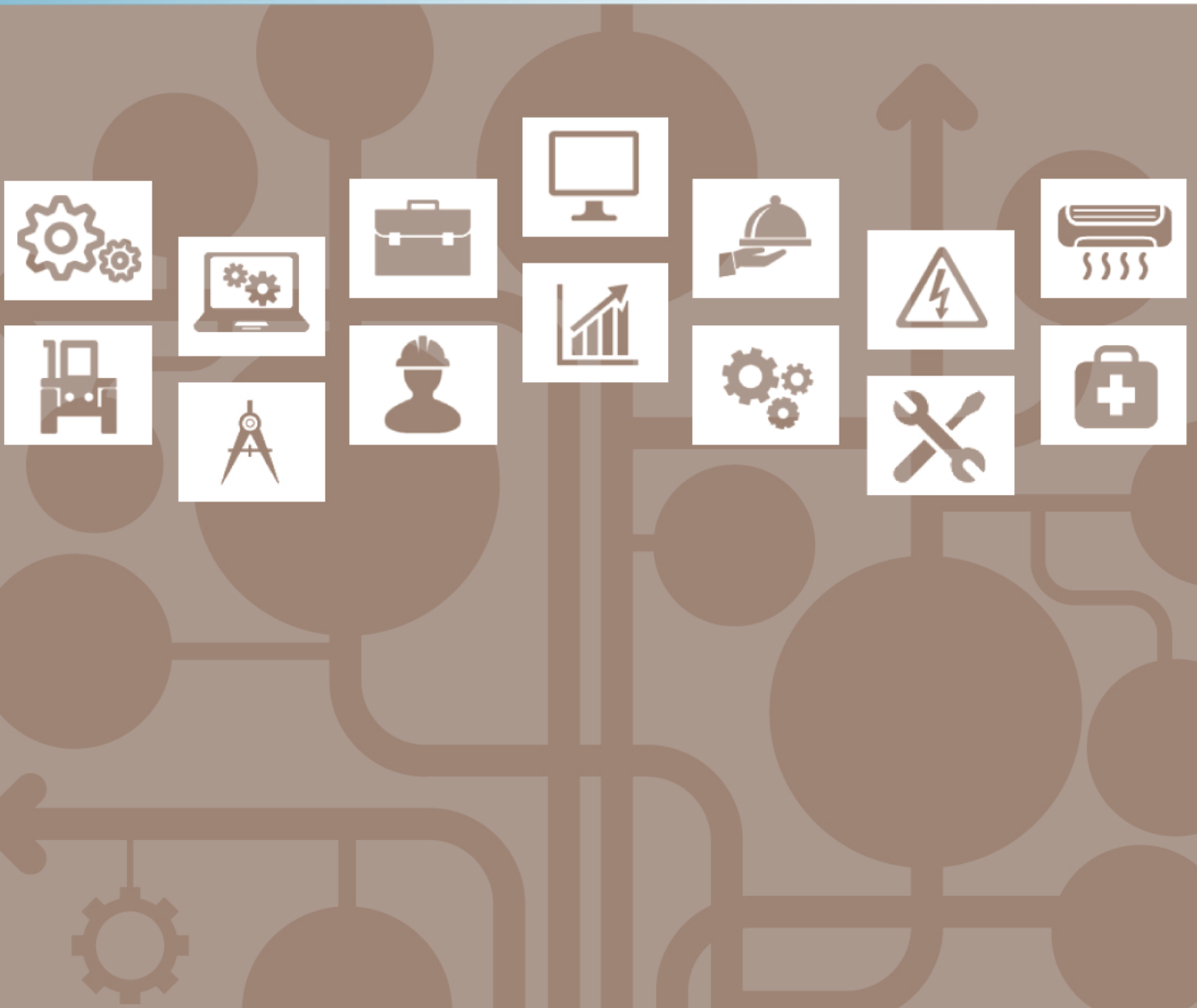




Entry Level Assessment Blueprint

Electronics



Test Code: 3034 / Version: 01

Specific Competencies and Skills Tested in this Assessment:

Safety

- Demonstrate understanding of SDS
- Exhibit understanding of ESD protection (electrostatic discharge)
- Exhibit understanding of PPEs (personal protective equipment)

DC Circuits

- Identify color-coded and SMT resistor codes
- Identify DC components
- Identify and understand DC circuitry
- Explain voltage and current relationships in series and parallel circuits
- Identify, calculate, and connect resistors in series, parallel, and combinational circuits
- Identify and understand DC schematic symbols
- Demonstrate understanding of Ohm's Law (DC circuitry)
- Understand DC power, energy, and sources

AC Circuits

- Identify AC components
- Identify and understand AC circuitry
- Demonstrate understanding of properties of electricity and magnetism
- Explain current and voltage phase relationships
- Identify and understand AC schematic symbols
- Demonstrate understanding of Ohm's Law (AC circuitry)
- Analyze waveforms
- Understand AC power, energy, and sources
- Demonstrate understanding of transformers
- Demonstrate understanding of power factor (apparent vs. true power)

Solid State Circuits

- Identify and understand solid state symbols
- Identify and understand diode types and circuits
- Demonstrate understanding of transistor operations (NPN-BJT, PNP-BJT, and FET)
- Identify and understand the functions of regulator circuits
- Identify and understand the functions of amplifier circuits
- Identify and understand the functions of oscillator circuits
- Identify and understand the functions of SCR circuits
- Identify and understand the functions of thyristor circuits (triac and diac)



Specific Competencies and Skills continued:**Soldering and De-Soldering**

- Identify and explain operation of soldering and de-soldering equipment
- Demonstrate through-hole and SMT soldering techniques

Use of Equipment

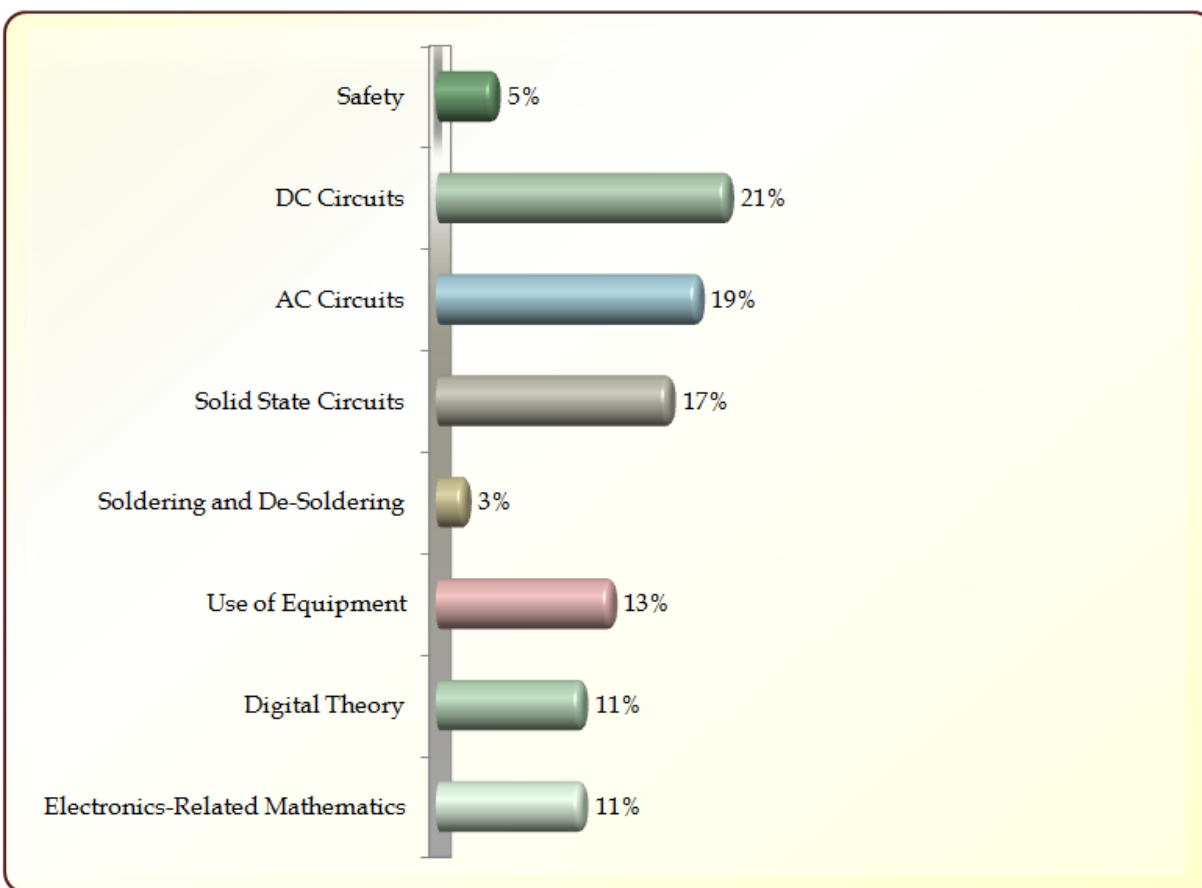
- Demonstrate the care and use of hand tools
- Demonstrate the care and use of multimeters (transistor, capacitance, and frequency)
- Demonstrate the care and use of oscilloscopes
- Demonstrate the care and use of power supplies
- Demonstrate the care and use of isolation transformers and variacs
- Demonstrate the care and use of function generators
- Demonstrate the care and use of logic probes

**Digital Theory**

- Use appropriate reference material
- Identify and understand digital symbols
- Demonstrate understanding of digital logic (gates, counters, and flip-flops)
- Recognize sequential and combinational digital circuits

Electronics-Related Mathematics

- Demonstrate knowledge of basic Boolean algebra
- Identify and understand gates and truth tables
- Demonstrate understanding of percentages and fractions
- Demonstrate understanding of algebra, geometry, and trigonometry
- Perform conversions of number systems and unit measurements

Written Assessment:**Administration Time:** 3 hours**Number of Questions:** 180**Areas Covered:**

Sample Questions:

The physical size of a resistor indicates

- A. resistance value
- B. voltage rating
- C. tolerance
- D. wattage rating

A battery generates electricity by

- A. thermoenergy
- B. proton potential
- C. electron potential
- D. chemical reaction

Zener diodes normally operate

- A. forward-biased
- B. reverse-biased
- C. without voltage
- D. non-biased

Which meter is always wired in series?

- A. ohmmeter
- B. ammeter
- C. wattmeter
- D. voltmeter

An ampere of current is the same as

- A. .001 mA
- B. 10 mA
- C. 100 mA
- D. 1000 mA

To help prevent eye injuries,

- A. wear safety glasses
- B. clip wires and components away from the body
- C. wear a safety shield
- D. look away while clipping wires and components

Conducting a magnetic field around a circuit or device is called

- A. shielding
- B. permeability
- C. hysteresis
- D. flux

Sample Questions (continued)

To properly store a solder pencil or start any soldering procedure, the technician should

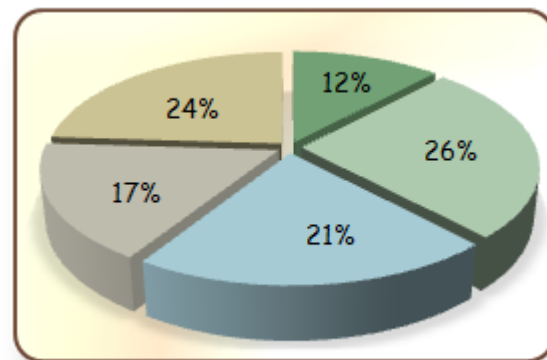
- A. tin the tip
- B. sweat the tip
- C. wipe the tip
- D. unplug the pencil

A triangle followed by a circle (bubble) describes a/an

- A. amplifier
- B. inverter
- C. AND gate
- D. NAND gate

A circuit allows 1 mA of current to flow with 1 volt applied. The resistance of the circuit equals

- A. 0.001m Ω
- B. 0.001 Ω
- C. 1 Ω
- D. 1,000 Ω

Performance Assessment:**Administration Time:** 3 hours and 10 minutes**Number of Jobs:** 5**Areas Covered:****12% IC Identification**

Participant will use the reference sheet and identify digital functions.

26% DC Circuit Construction and Analysis

Participant will choose components correctly, construct protoboards, complete calculations and measurements.

21% Power Supply Construction and Analysis

Participant will construct power supply, complete measurements and calculations.

17% De-Soldering and Soldering

Participant will de-solder, solder (re-solder), and identify components.

24% CE Amplifier Construction and Analysis

Participant will construct the CE amplifier, complete calculations, and measure voltage.

Sample Job: IC Identification**Maximum Time:** 10 minutes**Participant Activity:** The participant will go to the designated station and use the manual provided to identify integrated circuits.