JOB READY ASSESSMENT BLUEPRINT

ELECTRONICS

Test Code: 2034
Version: 01

Specific Competencies and Skills Tested in this Assessment:

DC Circuits
Identify color-coded resistors
Identify 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 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 and energy
Identify AC energy sources

Solid State Circuits
Identify and understand solid state symbols
Identify and understand diode types and circuits
Demonstrate understand of transistor operations (NPN-BJT and PNP-BJT)
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)

Electronics (continued)

Soldering and De-soldering
Soldering and de-soldering equipment
Demonstrate understanding of MSDS (Material Safety Data Sheets) relating to soldering and de-soldering
Exhibit understanding of ESD protective (electrostatic discharge)
Exhibit understanding of PPEs (personal protection 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 generator
Demonstrate the care and use of logic probes

Digital Theory
Use of a reference manual
Identify and understand digital symbols
Understand digital logic (gates, counters, and flip-flops)
Recognize sequential and combinational digital circuits

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

Written Assessment:

Administration Time: 3 hours
Number of Questions: 176

Areas Covered:

22%	DC Circuits
16%	AC Circuits
21%	Solid State Circuits
8%	Soldering and De-Soldering
12%	Use of Equipment
10%	Digital Theory
11%	Technical Related Mathematics

Sample Questions:

If a resistor's colors are yellow, red, black, and silver, the resistance and tolerance are
A. 42 ohms, 10 percent
B. 240 ohms, 10 percent
C. 420 ohms, 5 percent
D. 420 ohms, 10 percent

The two parallel lines that are between the coil symbols on a transformer represent the
A. air core
B. magnet
C. voltage
D. iron core

To remove excess solder from the soldering pencil,
A. tap the soldering pencil on the table
B. rub the solder off with your hand
C. wipe the solder off on your shirt
D. wipe the solder off on a wet sponge

The inverter gate has a
A. Logic 0 output with a Logic 0 input
B. Logic 0 output with a Logic 1 input
C. Logic 1 output with Logic 1 input
D. Logic 1 output with undefined input

If the input to a transistor amplifier is 20 mV and the output is 5 volts, the amplifier gain is
A. 25
B. 50
C. 250
D. 500

Electronics (continued)

The part of the atom concerned with current flow is the

A. outer valence electrons
B. nucleus
C. inner electron shells
D. neutrons

In a series R-L AC circuit, R and X_L are each 20 ohms. What is the phase angle?

A. 30 degrees
B. 45 degrees
C. 60 degrees
D. 90 degrees

The correct size of the solder pencil tip is

A. the largest possible
B. the smallest possible
C. sized according to the work
D. sized according to the solder

Pythagorean Theorem is stated using the formula

A. $C = A/B$
B. $C = A+B$
C. $C^2 = A^2+B^2$
D. $C^2 = A^2*B^2$

When calculating instantaneous voltage at any point on a sine wave, use a/an _____ triangle.

A. isosceles
B. acute
C. right
D. obtuse

Performance Assessment:

Administration Time: 3 hours and 10 minutes
Number of Jobs: 5

Areas Covered:

12% **IC Identification**
Participants will use the reference sheet, and identify digital functions.

26% **DC Circuit Construction and Analysis**
Participants will choose components correctly, construct protoboards, complete calculations and measurements.

21% **Power Supply Construction and Analysis**
Participants will construct power supply, complete measurements and calculations.

17% **De-Soldering and Soldering**
Participants will de-solder, solder (re-solder), and identify components.

24% **CE Amplifier Construction and Analysis**
Participants will construct the CE amplifier, complete calculations, and measure voltage.

Sample Job: IC Identification

Maximum Job Time: 10 minutes

Participant Activity: The participant will go to the designated station and use the manual that is provided to identify integrated circuits provided.