

Introduction to Electronics Artisan

Introduction to Electronics – Artisan Assessment

(A concise guide for learners preparing for the Artisan (Level 3) assessment in electronics)

1. Scope of the Assessment

Area	What you'll be tested on	Typical tasks
Safety & Legislation	• Electrical safety regulations (e.g., BS7671, OSHA) • Personal protective equipment (PPE) • Risk assessment and safe working practices	Conduct a site-specific risk assessment; identify required PPE for a given job.
Fundamentals of Electricity	• Voltage, current, resistance, power • Ohm's Law, Kirchhoff's laws • Power calculation and energy consumption	Calculate the current drawn by a 120 W lamp on a 240 V supply.
Electronic Components	• Passive components (resistors, capacitors, inductors) • Active components (diodes, transistors, ICs) • Electromechanical parts (relays, switches, transformers)	Identify component symbols on a schematic; select a suitable resistor value for a bias network.
Circuit Theory & Analysis	• Series & parallel networks • Voltage dividers, current dividers • Basic AC concepts (RMS, phase, impedance)	Analyse a mixed series-parallel resistive circuit and determine total resistance.
Soldering & Assembly	• Hand-soldering techniques • Use of soldering iron, flux, and desoldering tools • PCB handling and component placement	Produce a clean, reliable solder joint on a through-hole component.

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Assessment		
Testing & Measurement	• Use of multimeter, oscilloscope, LCR meter • Test procedures for continuity, insulation resistance, voltage, current, frequency • Interpreting waveforms • Systematic fault-finding (visual inspection ? measurement ? isolation)	Verify the output voltage of a 5V regulator using a multimeter.
Troubleshooting	• Common faults (open/short circuits, component failure, wiring errors) • Documentation of findings • Cable types, colour codes, conduit, cable trays	Locate a failed transistor in a simple amplifier circuit.
Installation & Wiring	• Termination methods (screw, crimp, solder) • Earthing and bonding • Relays, contactors, timers, PLC I/O basics	Terminate a three-core armoured cable to a distribution board.
Control & Automation Basics	• Simple ladder logic concepts • Sensors and actuators • Reading & creating schematics, wiring diagrams, bill of materials (BOM)	Wire a start-stop control circuit for a motor using a contactor and overload relay.
Documentation	• Test reports, risk assessments, maintenance logs • Use of CAD/CAE tools (optional)	Produce a wiring diagram for a lighting circuit.

2. Core Concepts to Master

2.1 Electrical Safety Fundamentals

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1. **De-energise & lock-out** – Always isolate power before work; apply lock-out/tag-out devices.

Assessment

2. **Earthing** – Ensure all conductive parts are bonded to earth to prevent shock.
3. **Residual-Current Devices (RCDs)** – Understand operating currents (30mA, 100mA) and test procedures.