



Level 2 Technical Certificate in Electrical Installation (8202-20)

October 2017 Version 1.0

Guide to the examination

Who is this document for?

This document has been produced for centres who offer **City & Guilds Level 2 Technical Certificate in Electrical Installation**. It gives all of the essential details of the qualification's external assessment (exam) arrangements and has been produced to support the preparation of candidates to take the exam/s.

The document comprises of four sections:

1. **Details of the exam.** This section gives details of the structure, length and timing of the exam.
2. **Content assessed by the exam.** This section gives a summary of the content that will be covered in each exam and information of how marks are allocated to the content.
3. **Guidance.** This section gives guidance on the types of questions included and examples of these.
4. **Further information.** This section lists other sources of information about this qualification and City & Guilds Technical Qualifications.

1. Details of the exam

External assessment

City & Guilds Technical qualifications have been developed to meet national policy changes designed to raise the rigour and robustness of vocational qualifications. These changes are being made to ensure our qualifications can meet the needs of employers and Higher Education. One of these changes is for the qualifications to have an increased emphasis on external assessment. This is why you will see an external exam in each of our Technical qualifications.

An external assessment is an assessment that is set and/or marked by the awarding organisation (ie externally). All City and Guilds Technical qualifications include an externally set and marked exam. This must be taken at the same time by all candidates who are registered on a particular qualification. We produce an exam timetable each year. This specifies the date and time of the exam so you can plan your delivery, revision and room bookings/PC allocation in plenty of time.

The purpose of this exam is to provide assurance that all candidates achieving the qualification have gained sufficient knowledge and understanding from their programme of study and that they can independently recall and draw their knowledge and understanding together in an integrated way. Whilst this may not be new to you, it is essential that your learners are well prepared and that they have time to revise, reflect and prepare for these exams. We have produced a Teaching, Learning, and Assessment guide that is you should refer to alongside the present document ([Teaching, Learning and Assessment Guide](#)). If a learner does not pass the exam at their first attempt, there is only one opportunity to resit the exam, so preparation is essential.

Exam requirements of this qualification

- **Electrical Installation** – Theory Exam (2 hours)

The exam is graded and a candidate must achieve at least a Pass grade in order to be awarded the qualification. (In addition to the exam, a synoptic assignment must also be completed and passed). You can find full details of the synoptic assignment in the *Qualification Handbook* and the *Synoptic Assessment Guide* – please see the link to the qualification page at the end of this document.

When does the exam take place?

The exam is offered on two fixed dates in April and June. The exact dates will be published at the start of the academic year in the *Assessments and Exam Timetable*

<http://www.cityandguilds.com/delivering-our-qualifications/exams-and-admin>.

At the start of the programme of study, in order to effectively plan teaching and exam preparation, centres should know when the exam will be taking place and allocate teaching time accordingly. Section 2 of this document gives a summary of the content that needs to be covered in order to prepare learners for the exam and full details of this are given in the *Qualification Handbook*.

Form of exam

The exam for this qualification can be taken either on paper (8202-520) or online (8202-020).

Can candidates resit the exam?

Candidates may resit the exam once only. If a candidate fails the exam both on the first attempt and when resitting it, that candidate has failed the qualification and cannot achieve it in that academic year.

How the exam is structured

Each exam has a total of 60 multiple choice questions.

- 25 Knowledge questions
- 23 Understanding questions
- 12 Applied knowledge questions

Multiple choice questions are used to confirm **breadth of knowledge and understanding**.

The applied knowledge multiple choice questions are designed to allow candidates to demonstrate **higher level and integrated understanding** through analysis and evaluation. This question also ensures the exam can differentiate between those learners who are 'just able' and those who are higher achieving.

More details about and examples of question types are given in Section 3 of this document.

Assessment Objectives

The exams are based on the following set of assessment objectives (AOs). These are designed to allow the candidate's responses to be assessed across the following three categories of performance:

- **Recollection** of knowledge.
- **Understanding** of concepts, theories and processes.
- **Integrated application** of knowledge and understanding.

In full, the assessment objectives covered by the exam for this qualification are:

| Assessment objective | Mark allocation (approx %) |
|--|----------------------------|
| <i>The candidate..</i> | |
| AO1 Recalls knowledge from across the breadth of the qualification | 42% |
| AO2 Demonstrates understanding of concepts, theories and processes from a range of learning outcomes. | 38% |
| AO4 Applies knowledge, understanding and skills from across the breadth of the qualification in an integrated and holistic way to achieve specified purposes. | 20% |

Booking and taking the exam

All assessments for City & Guilds Technical Exams must be booked through Walled Garden. There is a deadline for booking exams, synoptic assessments and any other centre marked assessments, please refer to the time line to check these dates.

The exam must be taken under the supervision of an invigilator who is responsible for ensuring that it is conducted under controlled conditions. Full details of the conditions under which the exam must be taken can be found in the Joint Council for Qualifications (JCQ) document, [Instructions for Conducting Examinations \(ICE\)](#).

Special consideration

Candidates who are unable to sit the exam owing to temporary injury, illness or other indisposition at the scheduled time may qualify for special consideration. This is a post-examination adjustment that can, in certain circumstances, be made to a candidate's final grade. The Joint Council for Qualifications' guide to the special consideration process can be found at www.jcq.org.uk.

To make a request for special consideration, please contact: policy@cityandguilds.com

Access arrangements

Access arrangements are arrangements that allow candidates with particular requirements, disabilities or temporary illness to take assessments, where appropriate, using their normal way of working. The Joint Council for Qualifications document, *Access Arrangements and Reasonable Adjustments* gives full details and can be downloaded [here](#).

For further information and to apply for access arrangements please see:

[Access arrangements - When and how applications need to be made to City & Guilds Applying for access arrangements on the Walled Garden](#)

2. Content assessed by the exam

Electrical Installation

The exam assesses:

- **Unit 201: Health and Safety and Industry Practices**
- **Unit 202: Electrical Science**
- **Unit 203: Electrical Installation**
- **Unit 204: Electrical Technology**

Each exam assesses a sample of the content of these units. This means that a single exam will **not** cover 100% of the unit content. The full range of content will be assessed over a number of examination series. Details of the coverage of a particular exam paper will **not** be released in advance of the exam itself. Centres should **not** make assumptions about what will be assessed by a particular exam based on what has been covered on previous occasions. In order to be fully prepared for the exam, learners **must** be ready to answer questions on **any** of the content outlined below.

The table below provides an overview of how the qualification's Learning Outcomes are covered by each exam and the number of **marks** available per Learning Outcome (ie **not** the number of *questions* per Learning Outcome). In preparing candidates for the exam, we recommend that centres take note of the number of marks allocated to Learning Outcomes and to assign teaching and preparation time accordingly.

In preparing candidates for the exam, centres should refer to the Qualification Handbook which gives full details of each Learning Outcome.

The following is a summary of only that qualification content which is assessed by the exam and **not** a summary of the full content of the qualification.

| Unit | Learning outcome | Topics | Number of MC Questions/ Marks |
|--|--|--|----------------------------------|
| 201 Health and Safety and Industry Practices | LO1 Know what legislation, regulations, laws and guidance documents are associated with the electrical industry. | 1.1 Statutory and non-statutory 1.2 Roles and responsibilities | 3 |
| | LO2 Use equipment on a construction site | 2.1 Use access equipment 2.2 Use Personal Protective Equipment (PPE) 2.3 Use power tools | |

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|------------------------|--|--|---|
| | LO3 Follow safety procedures, practices and policies on construction sites | 3.1 Produce Risk Assessments and Method Statements (RAMS) 3.2 Types of accident reporting 3.3 Principles of fire safety 3.4 Manual handling principles 3.5 Types of signage used on a construction site 3.6 Procedures for common hazardous materials 3.7 Procedures for dealing with asbestos found in the work place 3.8 Site safety management | |
| | LO4 Carry out electrical safety procedures and practices | 4.1 Safe isolation procedures 4.2 Construction site supplies 4.3 Perform safe isolation | |
| | LO5 Understand environmental protection | 5.1 Types of waste management and disposal 5.2 Reporting of hazardous waste 5.3 Type of pollution | |
| | LO6 Know the structure and roles of individuals and organizations within the construction industry | 6.1 Types of site personnel 6.2 Client and representatives 6.3 Relationships in the contract structure 6.4 Role of industry bodies | 1 |
| 202 Electrical Science | LO1 Apply mathematical principles | 1.1 Units of measurement 1.2 Work with equations 1.3 Work with geometry | 4 |

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|-----------------------------|--|---|----|
| | LO2 Understand direct current principles | 2.1 Electron theory 2.2 Properties of an electrical circuit 2.3 Principles of an electrical circuit 2.4 Measurement of electrical circuits | 7 |
| | LO3 Understand electromagnetic principles | 3.1 Principles of magnetism 3.2 Conductors in magnetic fields 3.3 Principles of electrical generation 3.4 Transformer principles | 6 |
| | LO4 Understand electronic components | 4.1 Operating principles of components 4.2 Applications and uses of components | 1 |
| 203 Electrical Installation | LO1 Use tools commonly used in electrical installation practices | 1.1 Use tools for electrical installation | 1 |
| | LO2 Erect cable containment/management systems used in electrical installation | 2.1 Selection of systems used in installation work 2.2 Types of forming/fabricating 2.3 Selecting fixings 2.4 Install systems | 11 |
| | LO3 Install wiring systems and supports used in electrical installation activities | 3.1 Factors affecting the selection of wiring systems 3.2 Types of support methods and application 3.3 Techniques for installing wiring components 3.4 Install wiring systems and supports | |

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|---------------------------|--|--|---|
| | LO4 Install accessories and terminate using a range of connections | 4.1 Factors that affect selection of accessories 4.2 Install accessories 4.3 Carry out connections | |
| 204 Electrical Technology | LO1 Understand how electricity is supplied and the characteristics of consumer's equipment | 1.1 Generation, transmission and distribution of electricity 1.2 Electrical intake arrangements 1.3 Features of consumer units/distribution boards 1.4 Types of earthing arrangements | 5 |
| | LO2 Understand isolation and protection | 2.1 Types of protection devices 2.2 Purpose of discrimination/selectivity devices 2.3 Purpose of isolation and switching | 1 |
| | LO3 Understand automatic disconnection of supply | 3.1 Principles of basic protection 3.2 Principles of fault protection 3.3 Purpose of earthing and bonding 3.4 Types of conductive parts 3.5 Types of earth fault paths | 5 |
| | LO4 Understand the principles of final circuits | 4.1 Arrangements of final circuits 4.2 Factors that affect load capacity 4.3 Factors and requirements of voltage drop | 1 |
| | LO5 Understand technical information | 5.1 Guidance publications used for electrical installation 5.2 Regulations that apply to electrical systems | 2 |

| | | |
|--|---|---------------------------------------|
| | 5.3 Manufacturer's information to support planning of electrical activities | |
| | 5.4 Drawings used to plan electrical activities | |
| | 5.5 Symbols and scales used in electrical documents | |
| LO6 Understand requirements for obtaining and providing client information | 6.1 Types of financial information | |
| | 6.2 Types of handover information | |
| | | Total marks for sections: 48 marks |
| | | Integration across units*: 12 marks |
| | | Total marks for exam: 60 Marks |

* *Integration across units*. These marks relate to Assessment Objective 4. These marks are awarded to differentiate between levels of performance by candidates taking the exam. The marks are given for how well a candidate has applied their knowledge, understanding and skills from across the units that make up the qualification in an integrated way to meet the requirements of the exam questions.

3. Guidance

Question types

The following explains, and gives examples of, types of questions used in City & Guilds Technical exams. In preparing candidates to take the exam, it is recommended that you familiarise them with the requirements of each question type so that they can be effective and make best use of the time available when sitting the exam.

- An effective candidate will gauge the type and length of response required from the question and the number of marks available (which is given for each question on the exam paper).
- Short answer questions may not require candidates to write in complete sentences. Extended response questions will require a more developed response.
- Candidates should read the exam paper before attempting to answer the questions and should allocate time proportionate to the number of marks available for each question or section.

| Question type | Example question | Mark scheme |
|--|--|-------------------|
| Multiple Choice questions These are objective questions with a predetermined answer. These consist of a question (or stem) and four options. The candidate should select the correct option (the key). The other 3 options (the distractors) will be plausible but incorrect in some significant respect so that the candidate is required to consider and reject these in order to identify the correct option. These questions are split into three types; | | |
| Knowledge MCQ | What type of sign is shown in the image below? | Correct answer: A |
| | | |
| | | |



- a. Warning.
- b. Mandatory.
- c. Prohibition.
- d. Information.

Understanding MCQ

Why is copper commonly used in the construction of cables?

Correct answer: A

- a. It has a low resistivity value which makes it a good insulator.
- b. It has a high resistivity value which makes it a good conductor.
- c. It has a high resistivity value which makes it a good insulator.
- d. It has a low resistivity value which makes it a good conductor.

Applied knowledge MCQ

The purpose of such questions is to stretch candidates who are able to and assess them on their higher order thinking skills such as analysis, evaluation and synthesis. When assessing higher order skills through MC we are looking for candidates to be able to formulate and make a judgement.

Which of the statements below identifies the protection intended if the equipment was found to be satisfactory?

Correct answer: C

- a. The cpc to the drill provides fault protection and the insulation on the live conductors provides basic protection.
 - b. The cpc to the drill provides basic protection and the insulation on the live conductors provides fault protection.
 - c. The cable insulation provides basic protection, the class of equipment provides fault protection and the RCD provides additional protection.
 - d. The cable insulation provides fault protection, the circuit breaker provides basic protection and the RCD provides additional protection
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Examination technique

Candidates with a good understanding of the subject being assessed can often lose marks in exams because they lack experience or confidence in exams or awareness of how to maximise the time available to get the most out of the exam. Here is some suggested guidance for areas that could be covered in advance to help learners improve exam performance.

Before the exam

Although candidates cannot pre determine the questions they will get in the multiple choice exams, the Technical qualifications do follow a common structure and format. In advance of taking the exam, candidates should:

- be familiar with the structure of the exam (ie number and type of questions).
- be aware of the amount of time they have in total to complete the exam.
- have a plan, based on the exam start and finish time for how long to spend on each question/section of the exam.
- be aware of how many questions are available for each sections.

At the start of the exam session

At the start of the exam, candidates:

- should carefully read through the instruction at the beginning of the exam paper before answering any questions.

Answering the questions

Candidates do not have to answer exam questions in any particular order. They may find it helpful to consider, for example:

- tackling first those questions which they find easiest. This should help them get into the 'flow' of the exam and help confidence by building up marks quickly at the start of the exam.

Candidates should **always** attempt every question, even questions where they may be less confident about the answer they are selecting. Candidates should be discouraged however, from spending too long on any answer they are less sure about, this could result in candidates having less time to answer questions that they are better prepared to answer.

Applied knowledge questions

The purpose of these questions is to stretch candidates who are able to and assess them on their higher order thinking skills such as analysis, evaluation and synthesis. When assessing higher order skills through MC we are looking for candidates to be able to formulate and make a judgement.

Candidates may find it helpful to read through the scenario, where applicable, and identify key information in the scenario. This will help them to analysis and evaluate the distractors to make a correct selection.

Towards the end of the exam

Candidates should always set aside time at the end of the exam to review their responses in order to make sure they are confident in their selection, ie their chosen answer.

Further guidance on preparing candidates to take the exam is given in the City & Guilds publication, [Technical Qualifications, Teaching, Learning and Assessment](#) which can be downloaded free of charge from City & Guilds website.

4. Further information

For further information to support delivery and exam preparation for this qualification, centres should see:

City & Guilds

Qualification homepage: <https://www.cityandguilds.com/qualifications-and-apprenticeships/building-services-industry/electrical-installation/8202-technical-in-building-services-engineering> which includes:

- Qualification handbook
- Synoptic Assignment
- Sample assessments

Technical Qualifications, Resources and Support: www.cityandguilds.com/techbac/technical-qualifications/resources-and-support

Joint Council for Qualifications

Instructions for Conducting Examinations: <http://www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations>