



# Level 2 Technical Certificate in Land-Based Engineering (0171-28) MCQs

November 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 Land-based Engineering**. 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 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. **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

This qualification has one pathway.

- **Level 2 Land based engineering** – 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 links at the end of this document).

### When does the exam take place?

This exam is offered either on-demand online through City & Guilds' computer-based testing platform or as paper-based on **two** fixed dates.

The on-demand online test can be taken at any time during the academic year.

Paper-based dated exams are offered on **two** fixed dates in February/March and May/June. The exact dates are 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, centres should know when the exam will be taking place and allocate teaching time accordingly in order to effectively plan teaching and exam preparation.

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 or online.

## 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 is made up of 50 multiple choice questions:

- Knowledge questions – 25 questions
- Understanding questions – 15 questions
- Applied knowledge questions – 10 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 of the subject. These questions 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 <b>Recalls knowledge</b> from across the breadth of the qualification	50%
AO2 <b>Demonstrates understanding</b> of concepts, theories and processes from a range of learning outcomes.	30%
AO4 <b>Applies knowledge, understanding and skills</b> 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](http://www.jcq.org.uk).

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

The exam assesses:

- **Unit 209: Transmission and driveline operation principles**
- **Unit 210: Engine operation principles**
- **Unit 212: Land based vehicle electrics**
- **Unit 213: Hydraulic systems**
- **Unit 214: Land Based vehicle and machinery operation**

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 **questions** available per Unit (each question is worth 1 mark). In preparing candidates for the exam, we recommend that centres take note of the number of questions 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 marks
209 Transmission and driveline operation principles	LO1 Understand the operating principles of land based transmission systems	1.1 Layouts of transmission systems 1.2 Function of major components of transmission systems	7
	LO2 Maintain and service transmission systems	2.1 Dismantle transmission components 2.2 Inspect transmission components 2.3 Reassemble basic transmission components	

	LO3 Operate transmission systems in land based vehicles and machinery	3.1 Transmission types 3.2 Use controls for transmission	
210 Engine operation principles	LO1 Know land based engine types and configuration	1.1 Types and uses of engines 1.2 System configurations	9
	LO2 Understand components used in engines	2.1 Relationship between engine components 2.2 Purpose of ancillary components 2.3 Function of system fluids	
	LO3 Know systems for controlling emissions	3.1 Impact of legislation on emission control 3.2 Basic systems for emission control	
	LO4 Service and maintain engine systems	4.1 Service and maintain engines 4.2 Test engine performance	
212 Land based vehicle electrics	LO1 Understand electrical system circuit types and components	1.1 Types and uses of circuits 1.2 Electrical circuit components 1.3 Units of electrical measurement 1.4 Electrical safety considerations	9
	LO2 Maintain and test circuits on land based vehicles	2.1 Maintain and test batteries 2.2 Maintain and test starting systems 2.3 Maintain and test charging systems 2.4 Maintain and test lighting systems 2.5 Record and report testing	

213 Hydraulic systems	LO1 Understand hydraulic system circuit types and components	1.1 Hydraulic circuit types 1.2 Hydraulic circuit components 1.3 Safety considerations	8
	LO2 Dismantle, inspect and reassemble hydraulic systems	2.1 Dismantle hydraulic systems 2.2 Inspect hydraulic system components 2.3 Reassemble hydraulic systems 2.4 Record and reporting test results	
214 Land Based vehicle and machinery operation	LO1 Know land-based vehicle components and operational checks	1.1 Legislation and regulation relating to the operation of land-based vehicles 1.2 Land-based vehicle components and controls	7
	LO2 Know types of machinery used in land-based settings	2.1 Types of land-based machinery 2.2 Factors affecting use of land-based vehicles	
	LO3 Operate land-based vehicles and machinery	3.1 Complete starting and stopping procedures on vehicles 3.2 Complete checks on land-based machinery 3.3 Operate land-based vehicles and machinery 3.4 Clean and decontaminate land-based vehicles	
	LO4 Complete hitching procedures for land-based vehicles	4.1 Attach implements to land-based vehicles 4.2 Detach implements from land-based vehicles	
	LO5 Maintain and store land-based machinery	5.1 Maintain land-based equipment and machinery 5.2 Store and clean land-based equipment and machinery	
Total marks for sections:			40 marks



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Integration across units\*: 10 marks

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**Total marks for exam: 50 marks**

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\* *Integration across units*. These questions relate to Assessment Objective 4). These questions are designed to demonstrate how well a candidate has applied their knowledge, understanding and skills from across the units that make up the qualification to meet the requirements of the exam questions. These question is also designed to differentiate between levels of performance by candidates taking the exam.

## 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 each type of multiple choice question.
- Candidates should read the exam paper instruction before attempting to answer the questions and should allocate time proportionate to each type of question.

### Question type:

### Example question:

#### Multiple Choice questions (MCQs)

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** section

- Recall of knowledge (AO<sub>1</sub>)
  - Understanding (AO<sub>2</sub>)
  - Applied knowledge (AO<sub>4</sub>)
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**Recall MCQs**

Which one of the following types of transmission is **most** likely to be found on a combine harvester driven by wheel motors?

- a) Semi-powershift.
- b) Full powershift.
- c) Mechanical.
- d) **Hydrostatic.**

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**Understanding MCQs**

How does a Selective Catalytic Reduction (SCR) system reduce the emission of Nitrogen Oxides?

- a) **Diesel exhaust fluid chemically reacts with exhaust emissions.**
- b) Exhaust emissions are removed by the diesel particulate filter.
- c) Exhaust emissions are removed by the catalytic convertor.
- d) Proportion of exhaust gases are recirculated into the inlet manifold.

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**Applied knowledge MCQs**

These question is often based on a short case study, scenario or other prompt. The level of detail should be gauged from the question and the number of marks available.

A customer has taken delivery of a new tractor and requested operator training. You have been asked to demonstrate the safe starting procedure and the correct sequence for attaching a PTO-driven three point linkage mounted implement.

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Which one of the following would prevent the tractor's engine from cranking?

- a) Seat switch disengaged.
  - b) Transmission in neutral.
  - c) Parking brake engaged.
  - d) Independent brakes latched.
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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 and 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 giving. 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.

## Extended answer questions

Before writing out in full their answer to extended questions, candidates may find it helpful to identify the key requirements of the question and jot down a brief plan or outline of how they will answer it. This will help clarify their thinking and make sure that they don't get 'bogged down' or provide too much detail for one part of the question at the expense of others.

## 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:* <http://www.cityandguilds.com/qualifications-and-apprenticeships/land-based-services/agriculture/0171-technical-in-agriculture-and-landbased-engineering#tab=information>

*Synoptic Assessment Guide:* <http://www.cityandguilds.com/qualifications-and-apprenticeships/construction/construction/7905-bricklaying#tab=documents+>

*Technical Qualifications, Resources and Support:* [cityandguilds.com/techbac/technical-qualifications/resources-and-support](http://www.cityandguilds.com/techbac/technical-qualifications/resources-and-support)

### Joint Council for Qualifications

*Instructions for Conducting Examinations:* [www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations](http://www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations)