

# Level 3 Technicals in Animal Management 0172-045/0172-545

Part of 0172-33

November 2017 Version 1.1

**Guide to the examination**

## Who is this document for?

This document has been produced for centres who offer **City & Guilds Level 3 Advanced Extended Diploma in Animal Management**. 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. **Guidance.** This section gives guidance on the language of the exam, the types of questions included and examples of these, and links to further resources to support teaching and exam preparation.
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

All candidates will take the following exam in the first year of the qualification:

- **0172-031/531 Level 3 Animal Management** – Theory exam (1).

This qualification has four possible pathways. The exam to be taken in the second year by a particular candidate will depend on the pathway chosen.

- **Zoos** – Theory exam (2 hours)
- **Wildlife** – Theory exam (2 hours)
- **Animal Management** – Theory exam (2 hours)
- **Science** – Theory exam (2 hours).

In addition to the exams, synoptic assignments 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.

This guide covers the **Science** pathway theory exam. This exam is graded and a candidate must achieve at least a pass grade in order to be awarded the qualification.

## When does the exam take place?

This qualification involves a two year programme of study. Candidates must take the exam at the end of the second year of study. The exam is offered on two fixed dates in March or 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 for each of the two years, 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 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 has a total of 60 marks available.

Each exam is made up of:

- 11 short answer questions;
- 1 extended response question.

Short answer questions are used to confirm **breadth of knowledge and understanding**.

The extended response question is to allow candidates to demonstrate **higher level and integrated understanding** through written discussion, 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

City and Guilds Technical 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 this exam are:

Assessment objective	Mark allocation (approx %)
<i>The candidate..</i>	
A01 <b>Recalls knowledge</b> from across the breadth of the qualification	23%
A02 <b>Demonstrates understanding</b> of concepts, theories and processes from a range of learning outcomes.	57%
A04 <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

### Science (1080)

The exam assesses:

- **Unit 315: Animal Nursing**
- **Unit 318: Fundamentals of science**
- **Unit 321: Cell biology and genetics**

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 marks
315 Animal Nursing	LO1 Understand veterinary terminology and common conditions	1:1 Recognise associated veterinary terminology 1:2 Common Medical conditions 1:3 Common Surgical conditions 1:4 Infectious diseases	14
	LO2 Understand veterinary practice procedures	2:1 Roles of staff in a veterinary practice 2:2 The importance of communication when dealing with staff and clients 2:3 Legislation for veterinary practices	

318 Fundamentals of science	LO1 Measure quantities for chemical reactions	1.1 Identify hazards and controls associated with chemical reactions 1.2 Key features of the periodic table, atomic structure and chemical bonding 1.3 Prepare chemical solutions and test their accuracy 1.4 Carry out volumetric calculations leading to accurate chemical quantities required for reactions	12
	LO2 Interpret the key features of equilibrium processes using the principles of good experimental design types	2.1 Principles of experimental design 2.2 Equilibria of liquids and gases across membranes	
321 Cell biology and genetics	LO1 Understand the structure and function of biological cells	1.1 Cell components of a mammalian cell 1.2 Functions of the organelles and life cycle of a cell 1.3 Comparison of cell types	22
	LO2 Understand the structure, function and replication of DNA	2.1 The structure and function of DNA and RNA 2.2 The process of DNA replication 2.3 The process of protein synthesis from DNA	
	LO3 Understand the principles of Mendelian inheritance for predicting inheritance	3.1 The principles of Mendelian genetics and the laws of inheritance 3.2 Gene interactions and their effects on inheritance 3.3 Analysis of breed data using simple probability tests	
	LO4 Understand the structure and function of tissues	4.1 Structure and function of epithelial tissue 4.2 Structure and function of connective tissue 4.3 Structure and function of muscle tissue 4.4 Structure and function of nervous tissue	

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Total marks for sections: 48 marks

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Integration across units\*: 12 marks

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**Total marks for exam: 60 Marks**

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\* *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

#### Vocabulary of the exam: use of 'command' verbs

The exam questions are written using 'command' verbs. These are used to communicate to the candidate the type of answer required. Candidates should be familiarised with these as part of their exam preparation.

The following guidance has been produced on the main command verbs used in City & Guilds Technicals exams.

A more detailed version of this table, which also includes the command verbs used in the assignments is published in *City & Guilds Technical Qualifications Teaching, Learning and Assessment* guide.

Command verb	Explanation and guidance
<b>Analyse</b>	Study or examine a complex issue, subject, event, etc in detail to explain and interpret, elements, causes, characteristics etc
<b>Calculate</b>	Work out the answer to a problem using mathematical operations
<b>Compare</b> (... and contrast) (or <b>describe</b> the similarities/differences)	Consider and describe the similarities (and differences) between two or more features, systems, ideas, etc
<b>Define</b>	Give the meaning of, technical vocabulary, terms, etc.
<b>Describe</b>	Give a detailed written account of a system, feature, etc <b>(..the effect of...on...)</b> the impact, change that has resulted from a cause, event, etc <b>(..the process..)</b> give the steps, stages, etc
<b>Differentiate</b> between	Establish and relate the characteristic differences between two or more things, concepts, etc
<b>Discuss</b>	Talk/write about a topic in detail, considering the different issues, ideas, opinions related to it
<b>Distinguish</b> between	Recognise and describe the characteristic differences between two things, or make one thing seem different from another
<b>Evaluate</b>	Analyse and describe the success, quality, benefits, value, etc (of an end product, outcome, etc )
<b>Explain</b>	Make (a situation, idea, process, etc) clear or easier to understand by giving details, <b>(..how..)</b> Give the stages or steps, etc in a process, including relationships, connections, etc between these and causes and effects.
<b>Give example(s) illustrate/</b>	Use examples or images to support, clarify or demonstrate, an explanation, argument, theory, etc

<b>Give a rationale</b>	Provide a reason/reasons/basis for actions, decisions, beliefs, etc
<b>Identify</b>	Recognise a feature, usually from a document, image, etc and state what it is
<b>Justify</b>	Give reasons for, make a case for, account for, etc decisions, actions, conclusions, etc, in order to demonstrate why they suitable for or correct or meet the particular circumstances, context
<b>Label</b>	Add names or descriptions, indicating their positions, on an image, drawing, diagram, etc
<b>List</b>	Give as many answers, examples, etc as the question indicates (candidates are not required to write in full sentences)
<b>Name</b>	Give the (technical) name of something
<b>Propose</b>	Present a plan, strategy, etc (for consideration, discussion, acceptance, action, etc).
<b>Select</b>	choose the best, most suitable, etc, by making careful decisions
<b>State</b>	Give the answer, clearly and definitely
<b>Summarise</b>	Give a brief statement of the main points (of something)

## 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:	Example response:
<p><b>Short answer recall questions (restricted response)</b></p> <p>These are questions which require candidates to give a brief and concise written response. The number of marks available will correspond to the number of pieces of information/examples and the length of response required by the question.</p>	<p>Muscle tissue is one of the <b>four</b> tissue types found in the body.</p> <p>List the other <b>three</b> types of muscle. (3 marks)</p>	<p><b>Indicative content:</b> 1 mark for each of the following, maximum of 3 marks.</p> <ul style="list-style-type: none"> <li>• Skeletal muscle (1)</li> <li>• Smooth muscle (1)</li> <li>• Cardiac muscle (1)</li> </ul>
<p><b>Short answer understanding questions (restricted response)</b></p> <p>These are questions which require candidates to give a brief and concise written response. The number of marks available will correspond to the number of pieces of information/examples and the length of response required by the question.</p>	<p>Describe the atomic structure, properties and electron configuration for the element shown in the image below: (4 marks)</p> <div> <p>23 Na Sodium 11</p> </div>	<p><b>Indicative content:</b> 1 mark for any of the following, maximum of 4 marks.</p> <ul style="list-style-type: none"> <li>• The atomic number shows that it has 11 protons each with a charge of +1 and 11 electrons each with a charge of -1 (1)</li> <li>• The atomic mass of 23 shows it has 11 protons each with a mass of 1 and 12 neutrons each with a mass of 1 (1)</li> <li>• There will be one electron shell with 2 electrons in the next will have 8 and the final shell with have 1 (1)</li> <li>• The electron configuration will be 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>1</sup> (1)</li> <li>• This configuration shows there is one electron in the outside 3s level so it has one valency electron (1)</li> </ul>

### Structured Response Questions

These are questions that have more than one part (eg a), b), etc.). The overall question is made up of linked, short answer questions which move the candidate through the topic in a structured way. For example, the question will usually start with a 'recall'/'state'/'describe' question followed by an 'explain' to draw out understanding of the topic. They usually have a shared introductory 'stem', and the number of marks may increase through the question.

a) Name **two** of the main mammalian cell organelles.  
(2 marks)

b) Describe the characteristics of an animal cell.  
(6 marks)

a) **Indicative content:** 1 mark for any of the following, maximum of 2 marks.

- Nucleus (nucleolus/nuclear envelope/chromatin) (1) Mitochondria (1) Microfilaments (1) Golgi apparatus (1) Rough endoplasmic reticulum (1) Smooth endoplasmic reticulum (1) Ribosomes (1) Centrioles (1) Plasma/cell membrane (1) Cilia (1)

b) **Indicative content:** 1 mark for any of the following, maximum of 4 marks.

- Animal cells are eukaryotic cells they have a nucleus which is enclosed in a nuclear membrane (1) The membrane is made of a bilayer (1) it has small holes in it called pores which will allow things such as ribosomes to pass through (1) The nucleus contains the nucleolus and chromatin (1) It has a cell membrane which is a phospholipid bilayer (1) that is selectively permeable (1).

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### Extended response questions

Extended response questions are those that require the candidate to write a longer written response using sentences and paragraphs. These usually require candidates to discuss, explain, etc. a topic in some detail. The question is often based on a short case study, scenario or other prompt. The level of detail should be gauged from

You are working in a veterinary practice when a cat is brought in with a suspected Feline Enteritis. You will administer fluid therapy to help alleviate some of the symptoms.

Discuss the signs, symptoms and treatments for the disease. You also need to consider which symptoms the fluid therapy will help with, how it should be administered and how this links to osmosis and diffusion.

**Band A (1-4 marks):** *The candidate briefly described the signs, symptoms and treatments of the infectious disease stated. The candidate briefly discussed why fluid therapy is required and how it should be administered, with suggestions made not always relevant or appropriate. Key points in relation to osmosis and diffusion were described, but clear gaps in knowledge are present in terms of the effect of placing a red blood cell in a solution at the wrong concentration. Technical terminology is used infrequently or inaccurately.*

*To access the higher marks within the band, the candidate will have attempted to justify their suggestions, but these may not all be valid.*

The cat would be sleepy and would be suffering weight loss. It is also likely to have a temperature and have diarrhoea. It may have a wobbly walk. The cat would be rehydrated using a drip. The drip would be placed in the leg or neck. The area is prepared by clipping and disinfection first.

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the question and the number of marks available.

**Indicative content:**

- Signs, symptoms and treatments for infectious diseases.
- Equipment required to administer fluid therapy.
- Identify the reasons for fluid therapy, routes for administration and fluids used.
- The pressure it takes to reach this equilibrium is called the osmotic pressure.
- Active transport and passive transport (movement of molecules into and out of cells)

Diffusion is the movement of a substance from a strong solution to a weak solution. Osmosis is the reverse of this. If the red blood cells are put into a weak solution the water will move in to the red blood cells and will blow up and burst. In too strong a solution the water would move out of the cells and they would shrivel up.

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**Band B (5-8 marks):** *The candidate described the signs, symptoms and treatments of the infectious disease stated in detail. The candidate discussed in detail why fluid therapy is required and how it should be administered. Key points in relation to osmosis and diffusion were described, with some gaps in knowledge present in terms of the effect of placing a red blood cell in a solution at the wrong concentration. Technical terminology is used frequently and mostly inaccurately.*

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*To access the higher marks within the band, the candidate provided justifications throughout, which are mostly valid and demonstrated an in-depth understanding of how the topics are linked to the question.*

The cat would be suffering from Lymphoma, anaemia, pale or inflamed gums, lethargy, progressive weight loss, abscesses, enlarged lymph nodes, persistent diarrhoea, ear infections, poor condition, and awkward movement. A drip would be used to counteract the dehydration caused by the diarrhoea. This would be done using an intravenous catheter with a saline solution. It is likely to be in the forelimb but could be rear limb or neck. The area is clipped and disinfected first. The sterile catheter would be placed into the vein. After the drip is set up it is taped and bandaged.

Diffusion is the movement of substances from an area of strong concentration to an area of weak concentration. Osmosis is the movement of water from an area of strong water concentration to an area of weak water concentration. When red blood cells are placed in a hypertonic solution they will shrivel up when they are placed in a hypotonic solution they will expand and even burst. Equilibrium will keep happening so that it will try to balance out the concentration.

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**Band C (9-12 marks):** *The candidate provided a comprehensive range of descriptions of the signs, symptoms and treatments of the infectious disease stated. The candidate accurately discussed why fluid therapy is required and how it should be administered correctly. Key points in relation to osmosis and diffusion were thoroughly described, with minor gaps in knowledge present in terms of the effect of placing a red blood cell in a solution at the wrong concentration. Technical terminology is used frequently and accurately in context.*

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*To access the higher marks within the band, the candidate provided a comprehensive range of valid justifications throughout and demonstrated a complex understanding of how the topics are linked to the question.*

The cat would be suffering from lethargy, progressive weight loss, abscesses, enlarged lymph nodes, persistent diarrhoea, ear infections, poor condition, and awkward movement. A drip would be used to counteract the dehydration caused by the persistent diarrhoea. This would be done using an intravenous catheter with a saline solution (0.9%) which is an isotonic solution. It is likely to be in the forelimb (cephalic vein) but could be rear limb (saphenous vein) or neck (jugular vein) if it is critical due to extreme dehydration. The area is clipped and disinfected first. The sterile catheter would be placed into the vein. After the drip is set up, with the bag should be placed higher than the patient so that the saline will flow by gravity, it is taped and bandaged in place.

Diffusion is the movement of substances from an area of strong concentration to an area of weak concentration. Osmosis is the movement of water through a semi permeable membrane from an area of strong water concentration to an area of weak water concentration. When red blood cells are placed in a hypertonic solution they will shrivel up, when they are placed in a hypotonic solution they will expand and even burst. The process is in dynamic equilibrium with water molecules moving in and out of the red blood cells in order to achieve isotonic conditions when the concentration inside the cell is the same as the concentration outside the cell.

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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 plan the answers they will give in advance, exams for 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 marks are available for each question, how much they should expect to write for each question and allow most time for those questions which have the most marks available.

### At the start of the exam session

At the start of the exam, candidates:

- should carefully read through the exam paper before answering any questions.
- may find it helpful, where possible, to mark or highlight key information such as command words and number of marks available on the question paper.
- identify questions which require an extended written answer and those questions where all or part of the question may be answered by giving bullets, lists etc rather than full sentences.

### 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.
- tackling the extended answer question at an early stage of the exam to make sure they spend sufficient time on it and do not run out of time at the end of the exam.

Candidates should avoid wasting time by repeating the question either in full or in part in their answer.

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 and providing answers that are longer and give more detail than should be necessary in the hope of picking up marks. This may be mean they have 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 read back through and review what they have written in order to make sure this is legible, makes sense and answers the question in full.

If a candidate finds they are running out of time to finish an answer towards the end of the exam, they should attempt to complete the answer in abbreviated or note form. Provided the content is clear and relevant, examiners will consider such answers and award marks where merited.

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/land-based-services/animal-management/0172-technical-in-animal-care-management-and-equine-care-management#tab=documents>

which includes:

- Qualification handbook
- Synoptic Assignment
- Sample assessments

Technical Qualifications, Resources and Support: [www.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: <http://www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations>