

# **Level 2 Technical Certificate in Digital Technologies (5220-21)**

## **Level 2 Digital Technologies 5220-022 / 5220-522**

**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 Digital Technologies (5220-21)**. 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

This qualification has **three** possible pathways. All three pathways are assessed by the following examination:

- **Level 2 Technical Certificate in Digital Technologies (022/522)** – Theory exam (2 hours and 30 minutes).

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?

The exam is offered on two fixed dates in **27/02/2018** or **22/05/2018**. The exact dates will be published at the start of the academic year in the *Assessments and Exam Timetable* <http://www.cityandguilds.com/~media/techbac/documents/Technical%20timetable%202018%20v1.2%205%20Sept%202018%20pdf.ashx>

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 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 **80 marks** available.

Each exam is made up of:

- Approximately 10-12 short answer questions;
- 1-2 extended response questions.

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

The extended response questions are to allow candidates to demonstrate **higher level and integrated understanding** through written discussion, analysis and evaluation. These questions also ensure 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	22.5%
AO2 <b>Demonstrates understanding</b> of concepts, theories and processes from a range of learning outcomes.	55%
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.	22.5%

## 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

### Level 2 Technical Certificate in Digital Technologies (5220-21)

The exam assesses:

- **Unit 201: Introduction to Digital Technologies**
- **Unit 202: Cyber security**
- **Unit 203: Introduction to supporting users**

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
201 Introduction to Digital Technologies.	LO1 Understand hardware requirements.	1.1 Types of systems 1.2 Characteristics of components and their functions 1.3 Install and configure hardware	30 marks
	LO2 Understand types of software.	2.1 Operating Systems 2.2 Device drivers 2.3 Application software	
	LO3 Understand network systems.	3.1 Network systems 3.2 Numbering systems	

		3.3 Implement networks	
	LO4 Understand digital engagement using collaborative technologies.	4.1 Risks associated with digital engagement 4.2 Digital engagement	
	LO5 Understand legislation related to the use of computers.	5.1 Legislation related to the use of computers	
202 Cyber security	LO1 Understand Cyber security threats and vulnerabilities.	1.1 Threats, risks and hazards 1.2 Impact of security breaches 1.3 Vulnerabilities	
	LO2 Understand Cyber security protection measures	2.1 Methods of mitigating risks 2.2 Configuring Cyber security technologies	22 marks
	LO3 Understand the backup process	3.1 Importance of backing up data 3.2 Backup tools 3.3 Types of backup 3.4 Backup and restore data	
203 Introduction to supporting users	LO1 Understand the support process	1.1 Benefits of providing support 1.2 Policies that impact on providing supporting users 1.3 Methods of collecting information from users	
	LO2 Support end users	2.1 Stages of supporting users 2.2 Gathering and recording information from end users	10 marks
	LO3 Understand end user documentation	3.1 Types of end user support documentation 3.2 Documentation production	
Total marks for sections:			62 marks

Integration across units\*: 18 marks

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**Total marks for exam: 80 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:

#### Short answer questions (restricted response)

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.

### Example question:

#### Mark scheme:

State **two** methods that are used to connect peripherals to computer systems. (2 marks)

#### Answer

**Accept any of the following or any other reasonable answer**

- Universal Series Bus (USB) 2/3 (1)
- Video Graphics Array (VGA) (1)
- Digital Versatile Interface (DVI) (1)
- High Definition Multimedia Interface (HDMI) (1)
- FireWire (IEEE1394) (1)
- Thunderbolt (1)
- Serial Advanced Technologies Attachment (SATA) (1)

**One mark for each method, maximum of two marks.**

**Test spec reference: 201 1.2**

**Total marks: 2**

## Question type:

### 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.

## Example question:

### Mark scheme:

- |                                                                                                               |           |
|---------------------------------------------------------------------------------------------------------------|-----------|
| a) Identify <b>two</b> personal risks and <b>two</b> organisational risks associated with digital engagement. | (4 marks) |
| b) For <b>two</b> of the risks identified in Question a), describe how <b>each</b> risk can be mitigated.     | (4 marks) |

### Answer

**a) Accept any of the following or any other reasonable answer**

#### Personal

- cyber bullying (1)
- harassment/trolling (1)
- identity theft (1)
- grooming (1)
- sexting (1)
- loss of personal information (1)
- phishing (1)
- inability to retract information posted online (1)

#### Organisational

- loss of sensitive information (1)
- loss of reputation (1)

- financial penalties for non-compliance (1)
- cyber-attacks (1)
- loss of service (1)

**One mark for each personal risk identified to a maximum of two marks. One mark for each organisation risk identified to a maximum of two marks. A maximum of four marks in total.**

**Answer**

**b) Accept any of the following or any other reasonable answer**

To minimise the risk to identity theft, limit the amount of information made available to (1) others in particular through the use of social media (1).

Organisations should educate their employees (1) on appropriate use of social media to avoid loss of reputation. Risk can be mitigated by reminding employees that they are all brand ambassadors and that every post or update represents a potential risk to the organisation (1).

**Two marks for each correction mitigation described, to a maximum of four marks.**

**Test spec reference: 201 4.1**

**Total marks: 8**

## Question type:

### 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 the question and the number of marks available.

## Example question:

### Mark scheme:

Discuss the hardware and software required to complete the Software Development Life Cycle in mobile application development. You should discuss an appropriate life-cycle model and any special skills needed to complete the development. (9 marks)

#### Answer

##### Indicative content

- Hardware and software requirements for software development
- Methods of development, life-cycles and skills
- Software application testing requirements and techniques

##### 0 – No awardable material

##### Band 1:

##### 1– 3 marks

The response demonstrates a limited understanding of the processes and technologies involved and is mostly a statement of facts which are not developed. The approach to the task is inconsistent. Statements may be occasionally incorrect and the use of precise technical language is sparse.

**Band 2:****4 – 6 marks**

The candidate has produced a discussion that expands on the factual knowledge but lacks detail in some areas. They show an adequate understanding of the processes and technologies involved including some reasons for their selection. They have provided some valid reasons for their choices. The response is structured and presented in a logical order.

**Band 3:****7 – 9 marks**

The candidate has produced a thorough discussion in a logical and professional manner. They show a thorough understanding of the processes and technologies involved and have covered these in the correct logical order, including reasons behind the processes and technologies, the factors that need to be considered and the impact these factors may have on the implementation. They have clearly understood how all of the processes and technologies link to one another in terms of order and importance. They have provided valid reasons for their choices. The response is clear, coherent and all information has been presented in a logical order.

**Test spec reference:****201: 1.1; 1.2; 2.3; 5.1****202****203****Total marks: 9**

## **Band 1**

### **1– 3 marks**

#### **Example band 1 response**

In mobile application development we need a mobile to test application in it. We need accessories depending on what type of application you are building for example if your application needs to connect to other devices you should test it by connecting them. We need a computer which runs the development software properly. We need software such as Android studio, Netbeans, choosing one of them which is best for your application. We can use the Waterfall model to create an application because it is easy to understand and use. Waterfall is best for small projects as it is easy to understand and use. In this model, phases should be completed before moving on. We should have knowledge of how to programme, design and test the application. We should have skills to use software. We need to know how the SDLC model really works and how we can go with its step. We also need a team with these skills.

## **Band 2**

### **4 – 6 marks**

#### **Example band 2 response**

A mobile application needs careful planning to make sure that all the resources are in place before you start because missing parts could cause delays. The tool to develop with must be the right one for the app to be done as there are several which do not suit all development for platforms. The software must be ones like Android studio. Netbeans and so forth.

The Waterfall life-cycle model would be a good choice because it has clear steps that are simple to understand and use. In the model there are phases that are completed before moving to the next one and the project moves in one direction in these phases. This means that it is very much easier to define the development time for the project. It is really good for small projects as the steps are clear. The RAD model might be good if the project needs to be done quickly but this can be complicated.

The application has to be completely tested at every stage on all platforms. The right security must be included to verify allowed users and prevent attacks by viruses. The security must also think about how the user will use the app so that they don't expose themselves to risks. And support must be given to help the user stay safe using the app.



### **Band 3**

**7 – 9 marks**

#### **Example band 3 response**

A mobile application needs careful planning to make sure that all the resources are in place before you start because missing parts could cause delays and these could be expensive and disappoint the client. The planning has to include the availability of people with the right skills and the money to pay them. Some staff could be freelance to use their skills but save money. The structure of who is in charge must be very clear.

The tool to develop with must be the right one for the app to be done as there are several which do not suit all development for platforms. The software must be ones like Android studio, App Inventor and Netbeans for android development, and XCode for development of Apple store apps. If you develop for Windows, Visual Studio and C# are the choice. It is possible to use frameworks that develop for more than one platform and these mean that the same code is used for all platforms.

The Waterfall life-cycle model would be a good choice if the specification is complete in advance because it has clear steps that are simple to understand and use. In the model there are phases that are completed before moving to the next one and the project moves in one direction in these phases. This can be bad if the plans change during the development and the prototype model would be better for that. The RAD Models makes things quicker because several parts are done at the same time.

The application has to be tested at every stage and on each platform to make sure that it meets the specification. The test plans must be developed when the specification is written and the test log must be available to everybody developing these in case a bug or mistake somewhere else affects them too. If security is important to the client, special attention must be given to testing whether that works and it must be clear how the app will not be attacked by malware. You must write good support material for the users and a website would work well because it's easy to update quickly with FAQs.

## 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 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: <http://www.cityandguilds.com/qualifications-and-apprenticeships/it/it-professional/5220-technical-in-digital-technologies#tab=information> which includes:

- *Qualification handbook*
- *Synoptic Assignment*
- *Sample assessments*

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)