



*Rewarding Learning*

**ADVANCED SUBSIDIARY (AS)  
General Certificate of Education**

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## **Digital Technology**

**Assessment Unit AS 2**

*assessing*

**Fundamentals of Digital Technology**

**[SDT21]**

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# **Assessment**

# **MARK SCHEME**

## General Marking Instructions

### Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

### The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

### **Additional Guidance for Marking**

Technical language is an integral part of Digital Technology as is abundantly clear from the material in the BCS Dictionary, as well as in the sets of Fact Files associated with this GCE specification. Obviously, candidates are required to be proficient with this technical language in order to understand fully the questions they are being asked. But more importantly, candidates are required to use this technical language in their responses, and to use it competently, liberally and appropriately. Paraphrasing, or the inaccurate use of the appropriate technical language will not be given credit. If they have not already done so, teachers should familiarise themselves with the Exemplification of Standards material on the Digital Technology microsite for both AS and A2. Every Chief Examiner's Report for this GCE Digital Technology specification has stressed that the most common reason why a candidate does not perform as well in the examinations as their Centres expected is because their responses have failed to reflect the required technical language.

Except when asked to list or identify an element of Digital Technology, in which case appropriate single words or phrases will be given credit, candidates are expected to answer using complete sentences. Furthermore, in assessing their candidates using the mark schemes, it is very important that teachers avoid 'cherry picking' part or parts of a mark point.

### **AO3 Assessment**

Some questions on each paper are identified as also assessing the candidate's quality of written communication. Teachers should be aware that the standard of assessment in these questions is considerably higher than elsewhere as these questions are also part of the examination's AO3 assessment. In particular, to achieve the two higher ranges of marks in these questions, candidates must use the appropriate Digital Technology terminology accurately throughout their response, and the presentation, spelling, punctuation and grammar must be of a high standard. An important further requirement is that candidates must produce a concise and focused response as indicated by the answer space allocated – the two higher band marks will not be awarded to responses lacking in focus, or which include irrelevant material, irrespective of how the response meets the other Marking criteria.

- 1 (a)** 0100 [1] 0111 [1]  
 1011 [1] 1001 [1] [4]  
 2 marks for each byte  
 or 1 mark for correct 4 bits in a byte
- (b)** +105 [1] for + sign [1] for 105  
 – 23 [1] for – sign [1] for 23 [4]
- (c)** Terabyte      Gigabyte      Kilobyte      Byte [1]
- (d)** 000  
 001  
 010  
 011 [1]
- 100  
 101  
 110  
 111 [1]
- (e)** 16GB = 16 × 1024 × 1024 × 1024 bytes  
 64 MB = 64 × 1024 × 1024 bytes
- $$\frac{16 \times 1024 \times 1024 \times 1024}{64 \times 1024 \times 1024}$$
- Answer: 256 seconds
- Correct conversion to bytes [2]  
 Correct division [2]
- Alternative calculations, e.g. conversion to MB accepted [4]

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- 2 (a) **Data**  
Raw facts, figures [1]  
150 is just a sequence of characters/digits [1]

**Information**

Data with a context/processed/meaning [1]  
The typical download speed for 4G is 150 Mbps [1] [4]

- (b) Accuracy [1] + Description [1]  
Completeness [1] + Description [1]  
Presentation [1] + Description [1]  
Reliability [1] + Description [1]  
(3 × [2]) [6]

(c) **Banded response**

*Proprietary software*: software that is sold under a name/patent and is copyrighted and limits against use and distribution by the vendor under a licence agreement

*Open source software*: refers to a program/software in which the source code is available to the general public to use or modify

Indicative content: definition of each type of software

Evaluation: cost comparisons – site licences, training, file conversion

Level of response	Marking criteria	Marks
<b>Band 2</b> <b>Excellent</b>	The candidate <ul style="list-style-type: none"> <li>Provides an accurate description of both proprietary SW and open source SW</li> <li>Evaluates both types of software with respect to reducing costs</li> <li>Uses the appropriate Digital Technology terminology accurately throughout the response</li> </ul> Presentation, spelling, punctuation and grammar are of a high standard.	[5]–[6]
<b>Band 1</b> <b>Good</b>	The candidate <ul style="list-style-type: none"> <li>Provides an accurate description of both proprietary SW and open source SW</li> <li>Uses some relevant Digital Technology terminology</li> </ul> Presentation, spelling, punctuation and grammar are sufficiently competent to make the response clear.	[3]–[4]
<b>Band 0</b> <b>Basic</b>	The candidate <ul style="list-style-type: none"> <li>Provides a description of proprietary SW and open source SW which is correct but which lacks detail</li> <li>Makes limited use of Digital Technology terminology</li> </ul> Presentation, spelling, punctuation and grammar are such that the intended meaning is not completely clear.	[1]–[2]

[6]

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3 (a) (i) Addition of the invoice number values for a batch [1] [1]

(ii) The hash total becomes part of batch/is transmitted along with the batch  
It is automatically recalculated post processing  
The calculated value is compared with the original value  
If the values are different then an error has occurred  
(3 × [1]) [3]

(iii) Example: invoice total, invoice cost  
This total is meaningful/useful  
... as it represents the total value/cost of all the invoices in the batch  
(3 × [1]) [3]

(b) **Weightings**

	5	4	3	2	
	×	×	×	×	
	4	2	3	5	8
Products	20	8	9	10	
Sum	47				
Division	47 ÷ 11 = 4 R 3				
	11 - 3 = 8 ✓				

Weightings, products, sum, division by 11, remainder, subtraction  
(6 × [1]) [6]

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(c) **Banded response**

*Data validation* is the automatic checking of data entered into a computer system

*Data verification* confirms the integrity of the data as it is copied between different parts of the computer system

Indicative content: definition of data validation and data verification

Evaluation: Validation can detect whether the data is a valid date

Verification will check that date entered is the intended date

<b>Level of response</b>	<b>Marking criteria</b>	<b>Marks</b>
<b>Band 2</b> <b>Excellent</b>	The candidate <ul style="list-style-type: none"><li>Provides an accurate description of data validation and data verification</li><li>Compares the effectiveness of both types of data validation with a date of birth</li><li>Uses the appropriate Digital Technology terminology accurately throughout the response</li></ul> Presentation, spelling, punctuation and grammar are of a high standard.	<b>[5]–[6]</b>
<b>Band 1</b> <b>Good</b>	The candidate <ul style="list-style-type: none"><li>Provides an accurate description of data validation and data verification</li><li>Uses some relevant Digital Technology terminology</li></ul> Presentation, spelling, punctuation and grammar are sufficiently competent to make the response clear.	<b>[3]–[4]</b>
<b>Band 0</b> <b>Basic</b>	The candidate <ul style="list-style-type: none"><li>Provides a description of data validation and data verification which is correct but which lacks detail</li><li>Makes limited use of Digital Technology terminology</li></ul> Presentation, spelling, punctuation and grammar are such that the intended meaning is not completely clear.	<b>[1]–[2]</b>

[6]

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MARKS**

<p><b>4 (a) Clock</b>          Produces pulses/timing signals          ... for the synchronisation          ... of operations between HW components/internal components          (2 × [1])</p> <p><b>Port</b>          Acts as a connection point          ... for IO devices          ... for data transfer          (2 × [1])</p> <p><b>(b) Card reader + type of input [1] + [1]</b>          Keypad + type of input [1] + [1]          Touch screen/pad + type of input [1] + [1]          (2 × [2])</p> <p><b>(c) Screen [1] + type of output [1]</b>          Printer [1] + type of output [1]</p> <p><b>(d) Auditory/speaker + type of feedback [1] + [1]</b>          Screen/printer message + type of feedback [1] + [1]</p> <p><b>(e) Process 1</b>          Copy PC [1]          to MAR [1]</p> <p><b>Process 2</b>          Load data [1]          into MDR [1]</p> <p><b>Process 3</b>          Execute instruction [1]          in CIR [1]</p> <p><b>(f) To prepare for next FE cycle [1]</b>          The PC points to the address of the next instruction [1]          ... to be fetched/executed [1]</p>	<p>[4]</p> <p>[4]</p> <p>[4]</p> <p>[4]</p> <p>[6]</p> <p>[3]</p>
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AVAILABLE MARKS
25

- 5 (a) Cookie**  
A small file [1] downloaded from a website [1] stores previous activities/preferences/or example [1] [3]
- Portal**  
A website [1] acting as the main entry point [1] for a group of web services [1] [3]
- Web hosting**  
Supports a website [1]  
Provides access to a web server [1] and web space [1] [3]
- (b) Anchor tag**  
Creates a hyperlink [1] which when clicked [1] navigates to another web page/part of a page or document [1] [3]
- Image tag**  
Inserts an image into a web page [1] The src or URL of the image is specified [1] Alternative text can be specified [1] [3]
- (c)** An unordered list [1] with 3 items 'Unit AS1' etc [1] [2]
- (d)** Change <ul> to <ol> [1]  
Change </ul> to </ol> [1] [2]
- (e) Banded response**  
Indicative content: description of CSS  
Evaluation: a single CSS in an external file can control the appearance all web pages in the website, maintenance of the appearance of all pages requires just one CSS file to be maintained

Level of response	Marking criteria	Marks
<b>Band 2</b> <b>Excellent</b>	The candidate <ul style="list-style-type: none"> <li>Provides an accurate description of CSS</li> <li>Explains how an external CSS controls all pages and that only one file need be maintained</li> <li>Uses the appropriate Digital Technology terminology accurately throughout the response</li> </ul> Presentation, spelling, punctuation and grammar are of a high standard.	<b>[5]–[6]</b>
<b>Band 1</b> <b>Good</b>	The candidate <ul style="list-style-type: none"> <li>Provides an accurate description of CSS</li> <li>Uses some relevant Digital Technology terminology</li> </ul> Presentation, spelling, punctuation and grammar are sufficiently competent to make the response clear.	<b>[3]–[4]</b>
<b>Band 0</b> <b>Basic</b>	The candidate <ul style="list-style-type: none"> <li>Provides a description of CSS which is correct but which lacks detail</li> <li>Makes limited use of Digital Technology terminology</li> </ul> Presentation, spelling, punctuation and grammar are such that the intended meaning is not completely clear.	<b>[1]–[2]</b>

[6]

**Total****AVAILABLE MARKS**

25

**100**