



*Rewarding Learning*

**ADVANCED SUBSIDIARY (AS)  
General Certificate of Education  
2025**

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## **Digital Technology**

**Assessment Unit AS 2**

*assessing*

**Fundamentals of Digital Technology**

**[SDT21]**

**TUESDAY 27 MAY, MORNING**

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**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 the 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. The document published represents the 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.

- 1 (a) (i)** The set of symbols  
... which can be represented  
in binary (format) [1] + [1] [2]
- (ii)**  $128 \cdot 2^7$   
[1] + [1] [2]
- (iii)** A non-printing/non-display character  
Example: end of file marker/null/space/  
backspace/tab/line feed/carriage return/escape/form feed  
[1] + [1] [2]
- (b)**  $00010101_2$   
 $11101100_2$   
[1] + [1] [2]
- (c)**  $2.5 \times 1024$   
2560  
[1] + [1] [2]

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**(d) ASCII**

ASCII uses 1 byte/7 bits/8 bits to represent each character  
 ASCII can represent  $2^7/2^8$  different characters/symbols  
 ASCII can represent 128/256 different characters/symbols

**Unicode**

Unicode uses 2 bytes/16 bits to represent each character  
 Unicode can represent  $2^{16}$  characters/Unicode uses 16 bits to represent  
 65536 characters

**Justification:**

**Multiple languages**

ASCII's 128 characters is only sufficient to represent characters of a single language

Unicode can represent characters of multiple languages as it can represent  $2^8$  or 256 times the characters of ASCII

**Memory requirements**

Unicode will require twice the memory required by ASCII for the same piece of text of text/for each character

Level	Marking criteria	Marks
<b>Band 2</b>	The candidate <ul style="list-style-type: none"> <li>• Describes two features of both ASCII and Unicode</li> <li>• States explicitly how Unicode requires twice as much memory as ASCII</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>	The candidate <ul style="list-style-type: none"> <li>• Describes two features of both ASCII and Unicode</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>	The candidate <ul style="list-style-type: none"> <li>• Describes one feature of both ASCII and Unicode</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]

16

2 (a) **Data**

Has no context/meaning

Any relevant example: 500 is a string of characters

2 × [1]

**Information**

Has context/meaning/data that has been processed

Any relevant example: 500 is the reorder level for the item

2 × [1]

**Knowledge**

Information is applied/information has rules applied

... and a decision made

Any relevant example: When the current stock level falls below the reorder level that item is automatically reordered

3 × [1]

[7]

(b) **Effective presentation**

Information that is not easy to understand

... loses its value

It should be presented in an appropriate format

... such as graphical rather than as text

[1] + [1]

**Reliability**

Information should be verified

... as trustworthy

Information from a direct source

... is more likely to be reliable than information from an indirect source

[1] + [1]

[4]

(c) **Proofreading**

Double entry

[1] + [1]

[2]

(d) **A batch total is the sum of one or more fields in a batch of data**

It is calculated before processing

It is recalculated

...and checked after processing

If the batch total has a meaning

... it is called a control total

Example: the total value of all invoices in a batch

If the batch total has no meaning

... it is called a hash total

Example: the total of all invoice numbers in a batch

6 × [1]

[6]

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**3 (a) Main memory**

Known as Random Access Memory or RAM  
 It stores a portion of the operating system  
 ... the application software currently running  
 ... and data required for processing  
 It is volatile  
 3 × [1]

**Clock**

Provides timing signals  
 ... to synchronize  
 the operation of the internal components  
 Determines how many computer instructions are executed each second  
 Clock speed is expressed in megahertz (MHz) or gigahertz (GHz)  
 3 × [1]

**Port**

A physical channel/socket/connection  
 ... where peripherals/devices can be connected  
 ... to enable data transfer  
 ... to/from the processor  
 3 × [1]

[9]

**(b) Address bus/control bus/data bus**

[1]

**(c) Increment PC**

Controls the order in which instructions are executed  
 The PC contains the address of the next instruction to be executed  
 When the instruction is fetched  
 ... one is added to the PC  
 ... to point to the next instruction sequence  
 3 × [1]

**Load data into MDR**

The MDR controls the flow of data between the CPU and IAS  
 The MDR acts as a buffer between the CPU and the IAS  
 It stores data being fetched from memory  
 ... or data being stored in memory  
 3 × [1]

[6]

(d) **RISC**

The instruction set contains instructions for only the most frequently used operations

Other operations require a number of RISC instructions

This enables a simpler processor design

**CISC**

The instruction set contains an instruction for every operation that the processor can perform

This requires a more complex processor design

**Evaluation:** Speed of processing

**RISC**

Simple operations are performed by one instruction and are executed very fast

Has a smaller instruction set so the fetch and execute cycle for common are less complex

More complicated operations require a number of FE cycles which can slow down processing speed

**CISC**

Each operation has a unique code so more complicated operations executed faster

Larger instruction set so more complex to fetch and execute

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Level	Marking criteria	Marks
<b>Band 2</b>	The candidate <ul style="list-style-type: none"><li>Provides a detailed description of each type of processor which is correct</li><li>Explicitly evaluates both types of processor with regards to speed of processing</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>	The candidate <ul style="list-style-type: none"><li>Provides a detailed description of each type of processor which is correct</li><li>Discusses the processing speeds of each type of processor</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>	The candidate <ul style="list-style-type: none"><li>Provides a description of each type of processor which is correct but lacks detail OR refers to the processing speed of both processors</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]

22

- 4 (a) Windows, icons, menus, pointers  
4 × [1] [4]
- (b) A single command can carry out multiple operations  
... so CLI users can execute commands quickly/efficiently  
[1] + [1]
- A CLI requires minimum resources/less processing power  
CLI can run on a wide range of simple devices e.g. control systems  
[1] + [1]
- A CLI provides access to additional commands/functions/shortcuts  
... so CLI users can execute commands quickly/efficiently  
[1] + [1]
- CLI allows users to execute scripts/batch files  
... automating repetitive tasks/enabling remote control  
[1] + [1]  
2 × [2] [4]
- (c) **Bitmap**  
No compression is used  
... so no image information is lost  
... but file sizes are large  
The number of bits per pixel determines the number of colours/depth of colour  
Higher resolution (more dpi) improves image quality  
Suitable for high quality images/photographers/drawings/continuous tones  
Pixelation/blurring occurs when images are enlarged  
3 × [1]
- Gif**  
A standard format for both animated and static images  
Uses lossless compression  
... so file sizes are small  
... no image information is lost  
Colour palette is limited to 256 colours  
... not ideal for storing digital photos  
Resolution-independent/scaleable images  
3 × [1] [6]

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**(d) Proprietary software:**

Proprietary software can be bought, leased or licensed from its owner  
It is copyrighted/patented and restricts its use and distribution via a licence agreement. Distribution or copying is prohibited  
It does not provide users with access to its source code. It remains the property of its owner

**Open source software:**

Open source software is usually free of copyright and available to anyone  
The source code is available for users or user-groups to view, modify or distribute for their own purposes  
Users can usually develop their own additional functionality

**Evaluation:**

With respect to reducing cost  
Proprietary software requires an annual licence/site licence. Additional functionality is charged for by the software provider  
Open source is generally free or has a minimal licence cost

Level	Marking criteria	Marks
<b>Band 2</b>	The candidate <ul style="list-style-type: none"><li>Provides a detailed description of each type of software which is correct</li><li>Explicitly evaluates with justification both types of software wrt reducing cost</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>	The candidate <ul style="list-style-type: none"><li>Provides a detailed description of each type of software which is correct</li><li>Discusses cost considerations</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>	The candidate <ul style="list-style-type: none"><li>Provides a description of each type of software which is correct but lacks detail <b>or</b> refers to the cost implication of each type of software</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]

20

5 (a) **Inputs**

Card inserted into card reader  
PIN/amount entered using keypad  
Menu choice entered via touch screen  
Continue request via button  
2 × [1] for appropriate input

**Outputs**

Instructions displayed on screen  
Error beep from speaker  
Cash from cash dispenser  
Card returned from card reader  
2 × [1]

[4]

(b) **URL**

The address/location  
... of a resource on the Internet e.g. webpage, image, file  
2 × [1]

**Web hosting**

Provides accessing to a web server  
... to enable the creation of a website  
... and the maintenance of the website  
... and makes it available of the World Wide Web  
3 × [1]

[5]

(c) `<ol>`

```
<li>Sun</li>  
<li>Moon</li>  
<li>Stars</li>  
</ol>
```

Correct `<ol>` and `</ol>` [1]  
[1] for each of three correct `<li>` `</li>` tags

[4]

(d) The domain name is

abc.co.uk

This includes the name of the host server

The top level domain name is

co

The second level domain name

abc.co

The country level is

uk

4 × [1]

[4]

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(e) **Public key**

The public key is made available via a publicly accessible directory

The sender encrypts the data using the recipient's public key

**Private key**

The private key remains confidential to its owner – the recipient

Only the recipient has the corresponding private key to decrypt the data

**Comparison:** Data security

Both keys are required to decrypt a message

There is a unique mathematical relationship between a public key and its corresponding private key

Anyone with the intended recipient's public key can send a message to them but the message can only be decrypted by the recipient using its corresponding private key so this is a very secure method

Level	Marking criteria	Marks
<b>Band 2</b>	The candidate <ul style="list-style-type: none"><li>Provides a detailed description of each type of key and the relationship between them which is correct</li><li>Evaluates the role of public and private keys in keeping data transfer secure with justification</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>	The candidate <ul style="list-style-type: none"><li>Provides a detailed description of each type of key which is correct</li><li>Discusses the role of public and private keys in keeping data transfer secure</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>	The candidate <ul style="list-style-type: none"><li>Provides a description of each type of key which is correct but 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]

**Total**

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23

**100**