



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2023**

Digital Technology

Assessment Unit AS 2

assessing

Fundamentals of Digital Technology

[SDT21]

MONDAY 22 MAY, AFTERNOON

**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.

ASCII requires less memory, smaller file sizes

Level	Marking criteria	Marks
Band 2	The candidate <ul style="list-style-type: none"> • Identifies the range of each method correctly and provides correct numerical detail • Compares the range of the two methods correctly and provides correct numerical detail • Uses the appropriate Digital Technology terminology accurately throughout the response Presentation, spelling, punctuation and grammar are of a high standard.	[5]–[6]
Band 1	The candidate <ul style="list-style-type: none"> • Identifies the range of each method correctly and provides correct numerical detail • Uses some relevant Digital Technology terminology Presentation, spelling, punctuation and grammar are sufficiently competent to make the response clear.	[3]–[4]
Band 0	The candidate <ul style="list-style-type: none"> • Identifies the range of each method correctly but omits numerical detail • Makes limited use of Digital Technology terminology Presentation, spelling, punctuation and grammar are such that the intended meaning is not completely clear.	[1]–[2]

[6]

**AVAILABLE
MARKS**

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		AVAILABLE MARKS																																																																																				
2	<p>(a) Data Raw facts/figures [1] Example 45/23 [1]</p> <p>Information Data in context/with meaning [1] Example: Mark of 45%/23% [1]</p> <p>Knowledge Applying information [1] ... to make a decision [1] Example: Student B must take new test [1]</p>	[7]																																																																																				
	<p>(b) Relevance Up to date Completeness Presentation Reliability (3 × [1])</p>	[3]																																																																																				
		10																																																																																				
3	<p>(a) (i) Name Double entry [1] Description The new password must be keyed in twice The computer checks that both match (2 × [1])</p> <p>(ii) Presence check</p>	[3] [1]																																																																																				
	<p>(b) Range check The value must lie between an upper boundary/bound/limit [1] ... and a lower boundary/bound/limit [1] Lookup The data value is compared or checked against [1] ... a list or table of valid/existing values [1]</p>	[4]																																																																																				
	<p>(c) 43177</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: right;">4</td> <td style="width: 15%; text-align: right;">3</td> <td style="width: 15%; text-align: right;">1</td> <td style="width: 15%; text-align: right;">7</td> <td style="width: 15%; text-align: right;">7</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">5</td> <td style="text-align: right;">4</td> <td style="text-align: right;">3</td> <td style="text-align: right;">2</td> <td style="text-align: right;">1</td> <td style="text-align: right;">Place values</td> <td style="text-align: right;">[1]</td> </tr> <tr> <td style="text-align: right;">20</td> <td style="text-align: right;">+ 12</td> <td style="text-align: right;">+ 3</td> <td style="text-align: right;">+ 14</td> <td style="text-align: right;">+ 7</td> <td style="text-align: right;">= 56</td> <td style="text-align: right;">Product & Sum [1]</td> </tr> <tr> <td style="text-align: right;">56</td> <td style="text-align: right;">÷ 11</td> <td style="text-align: right;">= 5 R 1</td> <td></td> <td></td> <td style="text-align: right;">Divide by 11</td> <td style="text-align: right;">[1]</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">Remainder</td> <td style="text-align: right;">[1]</td> </tr> <tr> <td></td> <td style="text-align: right;">R should be 0</td> <td style="text-align: right;">Invalid</td> <td></td> <td></td> <td style="text-align: right;">Comment</td> <td style="text-align: right;">[1]</td> </tr> </table> <p>Alternative Answer</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">43177</td> <td style="width: 15%; text-align: right;">4</td> <td style="width: 15%; text-align: right;">3</td> <td style="width: 15%; text-align: right;">1</td> <td style="width: 15%; text-align: right;">7</td> <td style="width: 15%; text-align: right;">7</td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;">5</td> <td style="text-align: right;">4</td> <td style="text-align: right;">3</td> <td style="text-align: right;">2</td> <td></td> <td style="text-align: right;">[1]</td> </tr> <tr> <td></td> <td style="text-align: right;">20</td> <td style="text-align: right;">+ 12</td> <td style="text-align: right;">+ 3</td> <td style="text-align: right;">+ 14</td> <td style="text-align: right;">= 49</td> <td style="text-align: right;">[1]</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">49/11=4R5</td> <td style="text-align: right;">[1]</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">Check Digit 11-5=6</td> <td style="text-align: right;">[1]</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: right;">Invalid</td> <td style="text-align: right;">[1]</td> </tr> </table> <p style="text-align: right; margin-right: 20px;">[5]</p>	4	3	1	7	7			5	4	3	2	1	Place values	[1]	20	+ 12	+ 3	+ 14	+ 7	= 56	Product & Sum [1]	56	÷ 11	= 5 R 1			Divide by 11	[1]						Remainder	[1]		R should be 0	Invalid			Comment	[1]	43177	4	3	1	7	7			5	4	3	2		[1]		20	+ 12	+ 3	+ 14	= 49	[1]						49/11=4R5	[1]						Check Digit 11-5=6	[1]						Invalid	[1]	13
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- 4 (a) (i) The faster the clock
 ... the more instructions the processor can execute
 ... in a given time
 (3 × [1]) [3]
- (ii) **Name** The processor type [1]
Description
 RISC has a smaller instruction set
 ... a number of instructions may be needed for a basic operation
 ... which slows down overall processing speeds
 CISC has a larger instruction set
 ... one instruction can perform a basic operation
 ... which speeds up overall processing speeds
 In dual-core/quad-core processors
 ... the workload can be shared between the cores
 ... enabling multitasking/multithreading
 (3 × [1]) [4]
- (b) **Name** Cache size [1]
Description
 Provides high speed access
 ... due to its close proximity to the processor
 ... to most frequently used instructions
 ... to most frequently used data
 The greater the cache size the greater the number of
 instructions/data that can be accessed at high speed
 ... of data/software
 ... to transfer data between devices
 (3 × [1]) [3]
- (c) Using a physical/on-screen keyboard
 Using a stylus
 Using speech recognition software
 Via its camera using character recognition software
 (3 × [1]) [3]
- (d) Zipping is used to compress files
 ... using lossless data compression
 It removes redundancies within data
 ... to reduce the overall file size
 ... to reduce the overall file size
 Faster transfer of files
 Faster download times
 (3 × [1]) [3]

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(e) Bitmap

Stores data about individual pixels
The number of bits determines the number of colours/colour depth
The resolution is number of bits per pixel(dpi). The resolution determines the number of colours

JPEG

Uses compression to reduce file size of an image
Identifies pixel arrangements that are repeated in the image and stores these once

Evaluation Image quality

Bitmap

Higher resolution results in better image quality The more bits per pixel, the greater the number of colours

JPEG

Uses lossy compression which can reduce image quality
The amount of compression can be controlled as a percentage

Level	Marking criteria	Marks
Band 2	The candidate <ul style="list-style-type: none"> Provides a full description of bmp and JPEG Provides an evaluation of bmp and JPEG, justifying any conclusions Uses the appropriate Digital Technology terminology accurately throughout the response Presentation, spelling, punctuation and grammar are of a high standard.	[5]–[6]
Band 1	The candidate <ul style="list-style-type: none"> Provides a description of bmp and JPEG which is correct Uses some relevant Digital Technology terminology Presentation, spelling, punctuation and grammar are sufficiently competent to make the response clear.	[3]–[4]
Band 0	The candidate <ul style="list-style-type: none"> Provides a description of either bmp or JPEG which is correct OR <ul style="list-style-type: none"> Provides a description of bmp and JPEG which is correct but lacks detail Makes limited use of Digital Technology terminology Presentation, spelling, punctuation and grammar are such that the intended meaning is not completely clear.	[1]–[2]

[6]

(f) File backup software stores copies of files

... enabling recovery
... if originals are destroyed
Archive software removes data from an information system
... which is no longer needed day to day
... but may be needed for historical/legal purposes

(4 × [1])

[4]

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- 5 (a) All the data to be input is collected together
 ... in a transaction file
 ... and then all processed in one go
 ... usually at a quiet period/overnight
 All data undergoes the same processing
 ... without human intervention
 (5 × [1])
 Unsuitable for flight reservations as double booking could occur [1] [6]

(b) **Multithreading**

- A thread is a process on a single set of data
 Different copies of a single program
 ... can process more than one set of data independently/at different stages
 ... concurrently/in parallel
 ... sharing all the available resources
 Data for each thread is kept separate
 Concurrent threading/single threading
 (3 × [1]) [3]

(c) Downloading

The SW files are downloaded and installed on the user's device
The user runs the SW by executing the appropriate file
Web access not required

Evaluation with respect to regular updates

The updated files must be downloaded after each update
Users may not be using the latest version of the SW
SW version management complicated

Via the Web

The user runs the SW by clicking on a link in their browser
Web access always required
No SW is installed on the user's device

Evaluation with respect to regular updates

To implement an update, the developer updates the Web link SW
Users will immediately access the updated SW
There is only one version of the SW so version management is straightforward

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Level	Marking criteria	Marks
Band 2	The candidate <ul style="list-style-type: none">Provides an accurate description of both methodsProvides an evaluation of both methods, justifying any conclusionsUses the appropriate Digital Technology terminology accurately throughout the response Presentation, spelling, punctuation and grammar are of a high standard.	[5]–[6]
Band 1	The candidate <ul style="list-style-type: none">Provides a description of both methods which is correctRefers to the suitability of both methodsUses some relevant Digital Technology terminology Presentation, spelling, punctuation and grammar are sufficiently competent to make the response clear.	[3]–[4]
Band 0	The candidate <ul style="list-style-type: none">Provides a description of either method which is correct OR <ul style="list-style-type: none">Provides a description of both methods which is correct but lacks detailMakes limited use of Digital Technology terminology Presentation, spelling, punctuation and grammar are such that the intended meaning is not completely clear.	[1]–[2]

[6]

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6 (a) Web server

Delivers webpages across the Internet/within an Intranet
Contains application software to transmit content
... and makes use of client-server technology
It processes requests for information
It returns a cache of web pages
... which are stored on the client for faster access
(3 x [1])

Internet service provider

Provides access to web servers
... a connection to Internet search engines
Provides bandwidth options/email/security features/web
hosting/filtering/digital phone or TV
(3 x [1])

[6]

(b) HTML uses tags

... to define the structure of a webpage
... and how the browser
... displays a web page
... including text
... hyperlinks/navigation
... and media files
HTML can be created using a text editor/web page editor
(4 x [1])

[4]

(c) CSS describes how HTML elements in a web page are displayed

... using the <style> tag
The CSS can be stored as an external file linked to a webpage
A single style sheet can be used for all the pages on a website
A number of style sheets can be linked to the same web page
... so that the content of the web page is defined for different devices
(3 x [1])

[3]

(d) Public key

The sender uses the public key of the recipient
... to encrypt the message
(2 x [1])

Private key

An encrypted message can only be decrypted
... by the recipient using their private key
(2 x [1])

[4]

Total

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MARKS**

17

100