



Rewarding Learning

**ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2024**

Digital Technology

Assessment Unit AS 2

assessing

Fundamentals of Digital Technology

[SDT21]

MONDAY 20 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.

| | | | AVAILABLE MARKS |
|---|--|-----|-----------------|
| 1 | <p>(a) 2 gigabytes = $2 \times 1024 = 2048$ megabytes $2 \times [1]$ $2048 \div 10 = 204.8$ seconds $2 \times [1]$</p> | [4] | |
| | <p>(b) 00 01 10 11 $4 \times [1]$</p> | [4] | |
| | <p>(c) One byte provides 28 different values These can represent the 128 characters in ASCII (or the 256 characters of extended ASCII) Two bytes provide 216 different values These can represent the 65536 characters in Unicode $4 \times [1]$</p> | [4] | |
| | <p>(d) (i) 01111111_2 +127 $2 \times [1]$</p> | [2] | |
| | <p>(ii) 10000000 -128 $2 \times [1]$</p> | [2] | 16 |
| 2 | <p>(a) (i) The Accept terms ... field It is a required field $2 \times [1]$</p> | [2] | |
| | <p>(ii) The Create username field The username must match the pattern described $2 \times [1]$</p> | [2] | |
| | <p>(iii) The Re-enter username field The system checks that both usernames match $2 \times [1]$</p> | [2] | |
| | <p>(b) (i) Data Has no context 1000 is a string of characters $2 \times [1]$</p> | [4] | |
| | <p>Information Has context 1000 is the Maximum payload in Kg of a Small van $2 \times [1]$</p> | [4] | |
| | <p>(ii) Information is applied ... and a decision made The customer requires a Large van as a Medium van is not high enough $3 \times [1]$</p> | [3] | |
| | <p>(c) Weighting Sum/total Divided Remainder $4 \times [1]$</p> | [4] | 17 |

3 (a) Processor

The processor consists of the Control Unit (CU)

... a series of registers

... and the Arithmetic Logic Unit (ALU)

It includes main memory/IAS

It carries out mathematical/logical operations

... during the FE cycle

3 × [1]

Data bus

Transfers instructions and data

... between processor components/memory/registers

... during the FE cycle

3 × [1]

Port

A physical channel/socket/connection

... where peripherals/devices can be connected

... to enable data transfer between devices and the processor

3 × [1]

[9]

(b) C B A E D

5 × [1]

[5]

(c) Features of USB memory stick

Uses flash memory/solid state technology. It is non-volatile

It has no moving parts

Its contents can be electrically erased and reprogrammed multiple times. It is random access storage medium

It has relatively high-speed access

It requires relatively little power

Evaluation for storing and transferring data between devices

It is very compact/portable/robust so is a very convenient method of storing and transferring data

Memory sticks can have a large capacity and are suitable for transferring and storing large amounts of data

The contents can be erased/re-written. A memory stick can be used many times

A USB port is available on most devices enabling data transfer between them

**AVAILABLE
MARKS**

| Level | Marking criteria | Marks |
|---------------|--|--------------|
| Band 2 | The candidate <ul style="list-style-type: none">Provides a detailed description of flash memory which is correctAddresses the suitability of flash memory for storing and transferring data with justificationUses 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 detailed description of flash memoryDescribes the suitability of a memory stick for storing data or transferring dataUses 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 flash memory which 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]

20

4 (a) **Multitasking**

A single user can perform more than one application at a time
 ... but only one application is actually running at any time
 The processor switches from one application to the next
 ... and resources/memory/peripherals are shared between the applications
 3 × [1]

Multithreading

Different copies of a single program or process
 ... can be executed at the same time
 The data set for each thread is kept separate
 The data sets can be at different stages of processing
 Can be concurrent or single threading
 3 × [1]

[6]

(b) **Command line interface**

There is a pre-set list of commands.
 Commands are usually one line and must follow syntax/structure
 Each command is entered at a prompt and usually includes parameters
 and/or switches

WIMP

This is a GUI
 Each task/process has its own window containing icons and/or menus
 A pointer and mouse/touchpad are used to navigate and to select icons
 and/or menu options

The inexperienced user

CLI Users require an intricate knowledge of hardware
 May find it difficult to remember the list of CLI commands
 May have difficulty entering CLI commands exactly due to lack of ICT skills
 WIMP more intuitive. Context sensitive help may be available
 WIMP skills are transferable

| Level | Marking criteria | Marks |
|---------------|--|---------|
| Band 2 | The candidate <ul style="list-style-type: none"> Provides a detailed description of both UI which is correct Addresses the suitability of both UI wrt the inexperienced user 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 detailed description of of both UI which is correct Refers to the suitability of one UI wrt the inexperienced user 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 one UI which is correct but which 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]

(c) JPEG

Uses lossy compression
Identifies patterns/similarities which are repeated in an image
... which are stored only once
Can reduce the file size
... but may lose some of the original image quality
Supports up to 24-bit colour
3 × [1]

GIF

A standard format for both animated and static images
Uses lossless compression
... so no image information is lost
Colour palette is limited to 256 colours
... not ideal for storing digital photos
Sound is not supported in animations
3 × [1]

[6]

18

AVAILABLE
MARKS

- 5 (a) WWW**
 An application which runs on the Internet
 ... consisting of a number of websites/webpages/hypertext documents
 2 × [1]
- Internet**
 A global network
 ... of networks
 2 × [1] [4]
- (b) Communication**
 To provide communication channels between employees
 ... such as email/multimedia messaging services
 [1] + [1]
- Collaboration**
 To provide tools to facilitate collaboration between employees
 ... such as project management software, calendars, timelines
 [1] + [1]
- Information/data sharing**
 To provide file access (or exchange) for employees
 ... so that they have relevant/most up-to-date information
 ... for decision making
 [1] + [1]
- Employee engagement**
 To provide information and learning opportunities for employees
 ... to keep employees informed/to enhance employee engagement
 [1] + [1]
 3 × [2] [6]
- (c) (i)** It will produce an unordered list
 ... with Dog, Cat, Mouse
 ... on separate lines
 ... with bullet points
 3 × [1] [3]
- (ii)** Displays the image *dog.gif*
 ... with the height and width specified in pixels
 ... as a hyperlink
 ... to the webpage address *www.abc.com*
 4 × [1] [4]
- (d)** Processing is split
 ... between the server computer
 ... and the client computer
 As much processing as possible is done on the client-side/on the
 downloaded page
 ... by client-side scripting/Javascript
 Example: validation such as field format checks/presence checks
 The completed page is returned to the server
 ... where the rest of the processing is completed
 Example: the actual booking is made
 6 × [1] [6]

- (e) **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:
 Proprietary software requires an annual licence/site licence, additional functionality charged by software provider
 Open source is generally free or has a minimal licence cost/users may be able to develop their own additional functionality

| Level | Marking criteria | Marks |
|---------------|---|---------|
| Band 2 | The candidate <ul style="list-style-type: none"> Provides a detailed description of both types of software which is correct Evaluate both types of software wrt cost 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 detailed description of both types of software which is correct Refers to the suitability of one method wrt development time with limited justification 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 one types of software which is correct but which 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]

Total

AVAILABLE MARKS

29

100