



Rewarding Learning

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

Digital Technology

Assessment Unit AS 1

assessing

Approaches to System Development

[SDT11]

FRIDAY 16 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 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.

- 1 (a) (i)** Allows the user to interact with/communicate with/control the computer system
 The user can input data
 The system outputs results
 3 × [1] [3]
- (ii)** Processes
 Data
 [1] + [1] [2]
- (b) (i)** The code written by the programmer
 ... in a high level language
 ... or a low level language/machine code/assembly language
 It must be translated before it can be executed
 [1] for each of two features [2]
- (ii)** To document code
 ... to make code more meaningful/readable
 ... by including comments/meaningful identifiers
 2 × [1]
- To test code
 ... during module/integration/system testing/using black box/white box testing
 ... following the test plan
 2 × [1]
- To debug code
 To detect/correct errors
 ... discovered during testing
 2 × [1]
 [2] for each of three responsibilities [6]

**AVAILABLE
MARKS**

(c) Observation

The analyst selects a representative sample of end users and shadows them as they perform their everyday tasks.
The purpose is to identify the processes they carry out and the data they use or generate as they perform them, the competencies required and the time taken

Questionnaires

A representative group of users
... complete a set of questions
The questions may be open
... or closed
The questions aim to identify current processes/data

Evaluation: Time comparison

Observation

This is time-consuming to plan and implement
Appropriate users must be identified
Schedule of observations arranged
Time to carry out the observation must be allocated
Only one observation can be made by each observer at a time

Questionnaires

These are more efficient in terms of the time taken to organise and complete them
They can be completed and returned using mail or e-mail
The results can be processed/summarised automatically, more efficiently

Level	Marking criteria	Marks
Band 2	The candidate <ul style="list-style-type: none"> Provides a detailed and accurate description of both methods Provides a detailed evaluation of both methods with justification 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 methods or compares both methods with regard to time issues 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 method which lacks detail or refers to one method with regard to time issues 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]

19

2 (a) **Functional requirement**

A function related to stock control which the system must do

Example: updating stock levels

Non-functional requirement

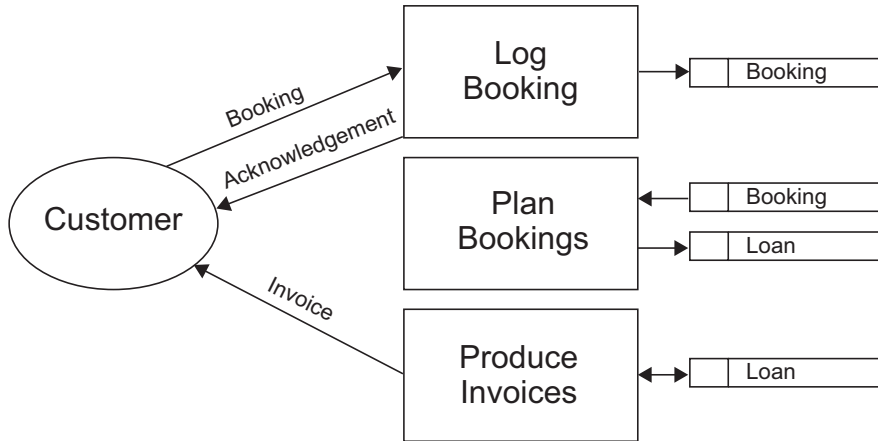
An additional function the system must do/a function not specific to stock control

Example: quality issues/performance issues/usability

4 × [1]

[4]

(b)



Processes 3 × [1]

Datastores 2 × [1]

Dataflows 4 × [1]

External dataflows 2 × [1]

[11]

15

3 (a) **Design**

To produce the systems specification

To specify the user interface /IO layouts/storyboards

... data structures/data validation and verification/DFDs/ERMs

... structure diagrams/flow diagrams/algorithms/pseudocode

... test plans/test schedule/test data

2 × [1]

Development

To implement the design/system specification

To create the software/code

To create the data structures

To create the user interface

2 × [1]

[4]

(b) (i) The prototype will focus on the input

... and output

... and navigation paths

3 × [1]

[3]

(ii) The prototype will focus on processes/functions

... so that data structures/tables

and relationships can be identified

3 × [1]

[3]

		AVAILABLE MARKS
<p>(c) (i) The item/element/component being tested Example: module/IO screen/variable/input box/validation rule Purpose/how the test will be carried out/test procedures to be used The test data/test cases to be used The expected outcomes/expected results 3 × [1]</p>	[3]	
<p>(ii) Beta testing Performed by the user/potential user ... who test a pre-release version ... <i>using real data/realistic volumes of data</i> ... <i>in a real-life environment</i> ... <i>to provide feedback to the developers</i> ... in preparation for the official launch/wider release</p> <p>Acceptance testing Performed by the user ... <i>to provide feedback to the developers</i> ... <i>using real data/realistic volumes of data</i> ... <i>in a real-life environment</i> ... so that the system can be signed off 6 × [1] MAX [3] for points in italics</p>	[6]	19
<p>4 (a) User documentation User guide/operating instructions Installation guide The HW/SW required Help/troubleshooting/FAQ support Training materials/tutorials 3 × [1]</p> <p>Technical documentation System specification/module specifications/user requirements Design components – DFDs, ERDs, storyboards, flowcharts, pseudocode/data dictionaries/IO formats/menu structures Database structures/tables/queries/reports Program documentation/purpose/listings/code/restrictions Test plans/test schedule/test data/test results/test schedule Hardware and software configuration/specification/requirements 3 × [1]</p>	[6]	
<p>(b) Both old and new system are used concurrently ...until the new system has proven itself/meets the system requirements Results from the new system are compared with those of the old system The old system is available for backup 4 × [1]</p>	[4]	

(c) Adaptive maintenance

Additional/new functions must be added
 The environment within which the system is used has changed/
 the user's requirements have changed
 ... for internal reasons/new business requirements
 ... for external reasons/ changes in legislation

Perfective maintenance

Although the system is meeting user requirements
 ... it could be made more efficient
 ... by optimising code
 ... upgrading hardware

Evaluation: The system remains suitable for the user

The aim of adaptive maintenance is to ensure the system will continue to meet the business needs of the user

The aim of perfective maintenance is to ensure the system continues to make the most effective use of emerging technology

Level	Marking criteria	Marks
Band 2	The candidate <ul style="list-style-type: none"> Provides a detailed description of each type of maintenance which is correct Evaluates both maintenance methods with regards to ensuring the system remains suitable for the user with justification 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 each type of maintenance or explains how each type of maintenance ensures the system remains suitable for the 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 each type of maintenance which lacks detail or refers to the purpose of each type of maintenance 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]

16

- 5 (a)** RAD is an incremental model/an iterative approach
 The whole project is subdivided into a series of builds
 Each build undergoes its own separate life cycle (requirements, design implementation/testing phases)
 Each build is developed in parallel
 ... within a set time frame
 RAD consists of business modelling and data modelling stages
 All the builds are assembled to produce the working system
 4 × [1] [4]
- (b)** To display in graphical form
 ... the start date
 ... and finish date
 ... of the different elements/activities of a project
 ... plotted against time
 ... and the dependencies between these
 4 × [1] [4]
- (c)** It allows the project manager to monitor/schedule the project's activities
 ... in order to minimise delays
 ... and to ensure that any conflicts are resolved
 It enables a model of the project to be constructed
 It enables the critical path (the minimum time needed to complete a project) to be calculated
 4 × [1] [4]
- (d)** If a natural disaster/flood etc. occurs, a business must be able to operate as normally as possible/in emergency mode
 ... until the emergency/disaster is over
 2 × [1] [2]
- (e)** Critical or key data/processes/personnel identified/risks will be identified
 The backup and recovery method will be described
 An alternative location will be identified from which the business can operate
 3 × [1] [3]
- 6 (a) Algorithm**
 The sequence of steps
 ... designed to solve a particular problem
 Written in pseudocode/as a flowchart
 2 × [1]
- Syntax**
 The set of rules
 ... defining the format/structure of each type of program statement/command/instruction
 2 × [1] [4]
- (b) Selection**
 An action will be executed
 ... if a condition is true/Boolean value is true
 An alternative action will be executed
 ... if a condition is false/Boolean value is false
 2 × [1]
- Iteration**
 A statement or sequence of statements can be executed more than once (or

even not at all)
 ... through the use of a loop which can be count-controlled or
 condition-controlled.
 2 × [1]

[4]

(c) OO approach

A class can inherit the properties/attributes and methods/behaviours of an existing class

The existing class is known as the base/parent/super class

The new class is known as a derived class/child/sub class

Inherited properties/attributes and methods/behaviours can be defined for the derived class

Inherited methods/behaviours can be re-defined or overwritten

Evaluation: code reuse

A new class does not have to be developed from scratch. The code of an existing class can be reused automatically. New code can be added for additional properties and additional/overwritten methods.

Level	Marking criteria	Marks
Band 2	The candidate <ul style="list-style-type: none"> Provides a detailed description of the OO approach including class reuse and inheritance Evaluates the OO approach with regards to code reuse 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 the OO approach which includes inheritance or describes a benefit of code reuse 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 the OO approach 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**

14

100