



ADVANCED
General Certificate of Education
2016

**Applied Information and
Communication Technology**

Assessment Unit A2 7

assessing

Unit 7: Investigating Systems

[A6J11]

MONDAY 23 MAY, MORNING

**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

Problem	Impact on Danny's Diners	Computer Solution
Uncontrolled access to the booking diary by many members of staff.	Inexperienced staff enter confusing info - dates and times may be mixed up leading to customer dissatisfaction e.g. if their table is not available when they arrive.	Require a password to record bookings. Validation rules for input data.
Poor records of stock requirements noted on whiteboard.	Omitted info – incorrect amounts of fresh stock not ordered leading to too much stock/too little stock (a financial impact) and options being removed from the menu (lower customer satisfaction). Confusion when deliveries arrived.	Implement a stock control system which monitors the levels of stock used and reorders when necessary.
No analysis of staff absences or rotas.	Not enough staff leading to stressful work conditions and poor customer service; staff may take off more days than they are entitled to and this remains undetected.	Reports comparing number of customers with number staff required – utilisation. Timesheet system, clock in/out
Danny is sometimes behind on payments to suppliers.	Suppliers may threaten legal action and have refused to supply leading to a restricted menu offering.	Reports showing outstanding payments to be made and details of the suppliers so that payment can be made quickly. Reminders and alerts.
The only communication between the two restaurant premises was by telephone.	Mixed up deliveries leading to restricted menu choices and lower customer satisfaction. Stock and account management difficult to merge – time-consuming. Telephone line may be busy leading to information not being transmitted.	Network the two locations together; provide email and internet based systems with database access from all sites.

AVAILABLE MARKS

[1] for each correct reason and [1] for each correct solution × 5 [10]
 Alternative valid answers other than that shown above are acceptable.

- 2 Typical student responses will include activities involved in planning, estimating, scheduling, monitoring performance and control (team management, conflict resolution, quality, change, risk and communication may be mentioned). How they are responsible for ensuring the project is delivered on time, within budget and within schedule to the customer's satisfaction.

Level 1 ([1]–[2])

Overall Impression: Basic

The candidate provides a basic answer demonstrating simple understanding of project management.

The candidate provides simple descriptions of a limited number of possible activities undertaken by a project manager with little reference, if any, of the responsibilities of a project manager.

The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence.

There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([3]–[4])

Overall Impression: Good

The candidate provides a good answer showing a reasonable understanding of project management.

The candidate provides descriptions of a number of possible activities undertaken by a project manager with some reference to the responsibilities of a project manager.

The candidate makes a reasonable selection and use of an appropriate form and style of writing.

Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

Level 3 ([5]–[6])

Overall Impression: Excellent

The candidate provides an excellent answer showing thorough understanding of project management.

The candidate provides good descriptions of a number of possible activities undertaken by a project manager covering a range of management areas with clear reference to the responsibilities of a project manager.

The candidate successfully selects and uses the most appropriate form and style of writing.

Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

All other valid answers will be given credit. [0] awarded for a response not worthy of credit. [6]

6

3 Typical student responses may include:

Problems

- Less flexibility
- Cost
- Training
- Expertise
- Technical issues
- Any 3 × [1] = [3]

Benefits

- More efficient
- Staff satisfaction
- More professional
- Less errors
- Any 3 × [1] = [3]

[6]

6

AVAILABLE
MARKS

- 4 The Structured Systems Analysis and Design Methodology (SSADM) covers most of the traditional system development life-cycle from analysis to system design. It takes a top-down approach where a high level picture of the system requirements are gradually refined into lower levels of detailed design. Documentation is produced at the end of each stage. It is useful for systems which are well-defined and large. It has been often used for Government projects. SSADM uses the techniques of Data Flow Modelling and Entity Relationship Modelling.

The Dynamic Systems Design Methodology (DSDM) is an agile methodology meaning that there is continual change and improvement. It is iterative (phases are repeated until the desired result is achieved) with continual incremental releases (a little bit at a time) to the users. The technique of time-boxing is used which fixes the deadline of each iteration and implements the requirements in order of priority is used. There is an emphasis on face-to-face communication rather than documentation. The project manager encourages collaboration and team work. It is most useful for small projects where the requirements are more uncertain. The technique of prototyping is used allowing high user involvement and feedback.

[1] for each correct answer × 10

[10]

10

5 (a)

Information Required	Answer
Estimated duration, in days, of activity H: Conduct Interviews.	6
Float available, in days, for activity I: Collect Documentation.	6
Activity which is dependent on activity F: Tabulate Results.	K
Predecessor of activity J: Analyse Documentation.	I
Earliest finish time, in days, for activity C: Conduct Observation.	4
Latest start time, in days, for activity E: Distribute Questionnaires.	8
All activities in the critical path.	A,G,H,K

[1] for each correct answer $\times 7$

[7]

(b) Delay -1

Delay by 1 day -1

Affect the critical path -1

Affect the float -1

Any 3 \times [1]

[3]

10

AVAILABLE
MARKS

- 6 Typical student responses may include, amongst other things, how the technique of observation discovers unexpected events (e.g. like the customers waiting for a table and leaving dissatisfied; diners being watched by customers waiting for seats), how the system works in practice rather than on paper (such as Maureen stepping outside her designated role to help at the tables) and can pick up problems that other methods like documentation cannot (such as the stress levels of the staff, etc.).

Level 1 ([1]–[2])

Overall Impression: Basic

The candidate provides a basic answer demonstrating simple understanding of the technique of observation.

The candidate provides simple and limited descriptions of why observation is a useful technique with few, if any, examples that may be discovered by Anne.

The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence.

There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([3]–[4])

Overall Impression: Good

The candidate provides a good answer showing a reasonable understanding of the technique of observation.

The candidate provides several reasons why observation will be useful for analysing Danny's Diner with some examples that may be discovered by Anne.

The candidate may briefly evaluate the technique of observation providing advantages or disadvantages.

The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence.

There is some use of appropriate specialist vocabulary.

Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

Level 3 ([5]–[6])

Overall Impression: Excellent

The candidate provides an excellent answer showing thorough understanding of the technique of observation.

The candidate provides several good reasons why observation will be useful for analysing Danny's Diner supported with good examples that may be discovered by Anne.

The candidate may evaluate the technique of observation providing good advantages and disadvantages.

The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

All other valid answers will be given credit. [0] awarded for a response not worthy of credit. [6]

6

7

	Entity	Data Flow	Process	File	None
customer	✓				
final reminder		✓			
take booking			✓		
customer booking details		✓			
booking diary				✓	
manage accounts			✓		
waitress					✓
supplier invoice		✓			
food					✓
list of average table times				✓	

[1] for each correct row × 10

[10]

10

AVAILABLE
MARKS

8 (a)	A context diagram contains more than one process.	FALSE
	A context diagram shows data stores/files.	FALSE
	External entities have an alphanumeric id.	FALSE
	A complete level-1 DFD shows all processes within the system boundary.	TRUE
	A level-1 DFD shows both internal and external data flows.	TRUE
	All the external data flows on a context diagram should be present on the corresponding level-1 DFD.	TRUE
	The identifier for a manual data store/file contains the letter M and an electronic data store/file contains the letter E.	FALSE

[1] for each correct answer × 7 [7]

- (b) (i) supplier
(ii) daily order
(iii) whiteboard
(iv) daily order details
(v) daily supplier delivery docket
(vi) manage deliveries
(vii) delivery docket details
(viii) delivery dockets

[8]

15

AVAILABLE
MARKS

- 9 (a) A typical student response may include, amongst other things: the manual system is confusing as data entry is inconsistent – missing telephone numbers and fields entered in different order/sequence, crossed out information, telephone numbers inconsistent for Ingram Love and Mr Valentine, possible overbookings, updates difficult to see. Can't see which tables are free easily; the new database system offers opportunities for validation such as bookings so no overbooking, queries showing free tables, easy updates and storage of customer information reducing duplication and inconsistency, consistent format for data entry, easy report/query generation.

Level 1 ([1]–[2])

Overall Impression: Basic

The candidate provides a basic answer demonstrating simple understanding of the benefits of a database approach.

The candidate provides simple and limited benefits of a database approach compared to the manual system with few, if any, examples.

The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([3]–[4])

Overall Impression: Good

The candidate provides a good answer showing a reasonable understanding of the benefits of a database approach.

The candidate describes benefits of a database approach compared to the manual system with examples.

The candidate makes a reasonable selection and use of an appropriate form and style of writing.

Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

Level 3 ([5]–[6])

Overall Impression: Excellent

The candidate provides an excellent answer showing thorough understanding of the benefits of a database approach.

The candidate clearly describes several good benefits of a database approach compared to the manual system and support these directly with specific examples and using appropriate terminology.

The candidate successfully selects and uses the most appropriate form and style of writing.

Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

All other valid answers will be given credit. [0] awarded for a response not worthy of credit.

[6]

- (b) (i)** Uniquely identifies a record and cannot be duplicated [1]
- (ii)** CustomerNo in Booking Table; TableNo in Booking table; foreign key Any 2 × [1] [2]
- (c)** Possible queries and benefits may include:
- the busiest periods – so that staff can be allocated most cost effectively.
 - tables which are free each time slot– so that tables use can be maximised.
- [2] for report and benefit × 2 [4]
- (d)** Possible report and benefit: (summary – management information)
- most popular meals — so that profit is maximised.
- [2] for report and benefit [2]

AVAILABLE
MARKS

15

- 10 A typical response may include the following re the test plan:
Content: written by the analyst at an early stage of lifecycle, and includes:
- what is tested
 - levels and type of testing
 - testing software tools
 - record-keeping
 - test data
 - responsibilities
 - test environment/equipment
 - schedule

Purpose: allows the development team to know what testing activities they need to undertake and allocates resources so the team is supported; testing activities can be monitored against the plan throughout the software development lifecycle and corrective action taken so that a high quality system fit for purpose is delivered. The testing system will aim to prevent errors occurring and should detect and correct defects as early as possible to reduce cost and improve quality.

Level 1 ([1]–[2])

Overall Impression: Basic

The candidate provides a basic answer demonstrating simple understanding of a test plan in software system development.

The candidate provides a simple discussion of the creation of a test plan including a limited description of its contents and purpose.

The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence.

There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

Level 2 ([3]–[4])

Overall Impression: Good

The candidate provides a good answer showing a reasonable understanding of the benefits of a test plan in software system development.

The candidate discusses the creation of a test plan including a description of its contents and purpose.

The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence.

There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

Level 3 ([5]–[6])

Overall Impression: Excellent

The candidate provides an excellent answer showing thorough understanding of the benefits of a test plan in software system development.

The candidates provides a good discussion of the creation of a test plan including a detailed description of its contents and purpose.

The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence.

There is widespread and accurate use of appropriate specialist vocabulary.

Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

All other valid answers will be given credit. [0] awarded for a response not worthy of credit. [6]

11

Issue	Most appropriate Support Solution	Justification
Danny has discovered an error with a validation rule.	Help Desk with remote PC repair; call centre.	This is a software problem and a new update will need to be provided. Danny should not fix this because he may introduce problems.
Maureen cannot remember how to update prices on the lunch menu.	On-Line Guide; User Guide	This is a common operational task of the business and would be a regular occurrence. The software should allow users to perform this operation and as a major function it should be described in the user documentation. There should be no need for higher level support such as a help-desk as this is a simple operation and nothing unexpected has occurred. Step by step guide/clear instructions.
The server has crashed and staff are using a temporary paper based system to record orders and deliveries.	On-site visit by expert; technician.	This is an emergency which seriously affects the business and its profitability. It must be dealt with as soon as possible and may require a new hard disk and expertise on site to solve the issue.

[1] for each support solution and [1] for each reason × 3

[6]

6

Total

100

AVAILABLE MARKS
6
100