

**GCE AS**

**Information and  
Communication Technology**

**January 2009**

**Mark Schemes**

Issued: April 2009



**NORTHERN IRELAND GENERAL CERTIFICATE OF SECONDARY EDUCATION (GCSE)  
AND NORTHERN IRELAND GENERAL CERTIFICATE OF EDUCATION (GCE)**

**MARK SCHEMES (2009)**

**Foreword**

***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 16- and 18-year-old 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 a 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.

The Council hopes that the mark schemes will be viewed and used in a constructive way as a further support to the teaching and learning processes.



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*Rewarding Learning*

**ADVANCED SUBSIDIARY (AS)  
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## **Information and Communication Technology**

**Assessment Unit AS 1**

*assessing*

**Module 1: Fundamentals of Information  
and Communication Technology**

**[ASW11]**

**MONDAY 12 JANUARY, AFTERNOON**

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**MARK  
SCHEME**

- 1 (a) The guest's handwriting may be illegible  
 ... to the person keying in the details will enter the wrong details  
 [1] for each of **two** points
- The person keying in the details might make a mistake  
 ... e.g. a transcription error/a substitution error  
 ... and key in the wrong data  
 [1] for each of **two** points
- The program/macro producing the mailing list may contain an error  
 ... due to a mistake by the programmer/designer/creator  
 ... and process an incorrect mailing list  
 [1] for each of **two** points
- A guest's details may have changed since the form was completed  
 e.g. A guest may move to a new address  
 [2] for each of **two** reasons [4]
- (b) (i) A direct data source is designed for a specific data collection purpose  
 In this case it is the registration form itself  
 ... used to collect details about the guests  
 [1] for each of **three** points [3]
- (ii) An indirect data source is a data source used for a purpose for which it was not originally intended  
 The data from the registration forms will be used for another purpose  
 ... such as to create a mailing list for promotional purposes  
 [1] for each of **three** points [3]
- 2 (a) Hardware cost [1]  
 Purchasing new PCs/peripheral devices  
 Upgrading PCs/peripherals  
 Leasing PCs/peripherals devices  
 [1] for **one** point
- Software cost [1]  
 Purchasing application software/programming software  
 Leasing application software  
 Purchasing site licences  
 Software maintenance  
 [1] for **one** point
- Personnel cost [1]  
 Employing/contracting software developer/designer  
 Training users  
 Redundancy costs  
 [1] for **one** point [6]

10

(b) It might be inaccurate  
... due to errors in the original sales data  
[1] for each of **two** points

It might be irrelevant  
... and not show the specific sales figures required  
[1] for each of **two** points

It might be out of date  
... and not show the latest monthly sales figures  
[1] for each of **two** points

It might be poorly presented  
... and not show the sales figures as clearly/in the form required  
[1] for each of **two** points

It may be incomplete  
... some figures may be missing  
[2] for each of **three** reasons

[6]

12

3 (a) The same e-mails can be sent to all participants at the same time  
... using an address book/contacts list  
[1] for each of **two** points

The sender of an e-mail can get confirmation that the message was  
opened by each recipient  
... by requesting automatic notification  
[1] for each of **two** points

Relevant attachments can be sent with an e-mail  
... such as the agenda  
[1] for each of **two** points

The meeting date can be added automatically  
... to each recipient's calendar  
[1] for each of **two** points

The recipient can be notified of new mail  
... automatically/on the desktop  
[2] for each of **three** benefits

[6]

(b) The participants do not have to travel to one location  
... thereby saving travel/accommodation expenses  
[1] for each of **two** points

The participants do not have to travel  
... travelling time is eliminated/the meeting can be set up at short  
notice  
[1] for each of **two** points

The meeting can be saved in digital form  
... and replayed/used for staff who could not attend/kept as a record  
of the meeting

[1] for each of **two** points

[2] for each of **three** points

[6]

12

- 4 (a) To perform calculations  
... such as total/average/best attendances  
[1] for each of **two** points

Use of conditions/look up tables  
... e.g. highlighting poor attendees  
[1] for each of **two** points

To produce charts/graphs  
... showing summaries/trends in attendance  
[1] for each of **two** points

[2] for each of **two** activities

[4]

- (b) To hold details of students  
... such as contact details/names/addresses/phone numbers  
[1] for each of **two** points

For querying  
... to identify poor attendees for example  
[1] for each of **two** points

For reporting  
... to produce class lists/poor attendance lists  
[1] for each of **two** points

[4]

[2] for each of **two** activities

- (c) For producing letters to students/parents/LEAs  
... about poor/good attendance  
[1] for each of **two** points

Spellchecking documents automatically  
e.g. letters sent to pupils  
[1] for each of **two** points

For mail shots/mail merge  
... so that personalised warning/congratulatory letters can be sent  
[1] for each of **two** points

[2] for each of **two** activities

[4]

12

- 5 (a) System software [1]  
 The operating system  
 ... provides the HCI/manages resources/devices  
 [1] for each of **two** points
- Application software [1]  
 Performs the processing/task required by the users  
 e.g. word processing/databases/spreadsheets/  
 [1] for each of **two** points [6]
- (b) User name and password system  
 Only authorised users  
 ... can access data stored on the system  
 [1] for each of **three** points
- Access levels  
 Users can be restricted  
 ... in their access to the data stored on the system  
 e.g. some users will have read only access and will not be able to alter data  
 [1] for each of **three** points
- Data could be encrypted  
 ... by coding and decoding using an algorithm  
 ... so that it is meaningless if intercepted  
 [1] for each of **three** points
- Use of biometric checks  
 e.g. retina scans  
 These are performed before a user can log on  
 [1] for each of **three** points
- [3] for **one** method [3]
- (c) Users should be made aware of the risks  
 Users should be trained  
 ... in using the system  
 ... so that they will not accidentally damage the data  
 ... or accidentally enable others to make unauthorised access  
 e.g. locking terminals/keeping passwords private  
 [1] for each of **three** points [3]
- 6 (a) Increased customer base  
 ... worldwide/anyone with access to the Internet  
 [1] for each of **two** points
- Increased hours of business  
 ... 24/7  
 [1] for each of **two** points

12

Stock efficiencies/increased range of books Books can be stored in one/less expensive location [1] for each of <b>two</b> points		
Increased chance of “accidental” visitors ... due to search engine matches [1] for each of <b>two</b> points		
Multimedia/interactive book advertisements ... author biops/reviews ... extracts [1] for each of <b>two</b> points		
[2] for each of <b>three</b> benefits	[6]	
<b>(b)</b> Risk of fraud Payment details/identity may be stolen [1] for each of <b>two</b> points		
The book has to be delivered/posted to the buyer This can increase the time taken to get the book There could be a postal charge [1] for each of <b>two</b> points		
[2] for <b>one</b> drawback	[2]	
<b>(c)</b> To keep up to date with the literary world/what competitors are doing They could visit related web sites They could perform detailed searches using a search engine [1] for each of <b>three</b> points		
On-line ordering from suppliers Checking the status of orders/accounts Communicating via e-mail [1] for each of <b>three</b> points		
On-line management of customer orders ... progress reports via e-mail ... mail shots of special offers ... confirmation of orders via e-mail [1] for each of <b>three</b> points		
[3] for <b>one</b> use	[3]	
<b>(d)</b> Its use would be restricted to employees of the bookshop They could use it for internal/private communications Shared data could be restricted to company employees [1] for each of <b>three</b> points	[3]	

- 7 (a) Acquisition of hardware  
 ... and systems software  
 Installation of new system  
 Data conversion  
 Changeover to new system  
 User training  
 [1] for each of **three** points [3]
- (b) Modifications will be made to the system  
 Perfective/adaptive/corrective maintenance  
 The system will be re-tested  
 [1] for each of **three** points [3]
- (c) Analysis [1]  
 Feasibility study carried out  
 Detailed investigation of existing data flows/processing  
 Different methods of fact finding used  
 Recommendations produced  
 [1] for each of **three** points
- Design [1]  
 System specification produced  
 Hardware/software specified  
 User interface designed/Input and outputs specified  
 Data models/structures specified  
 Modular structure developed  
 Test strategy specified  
 [1] for each of **three** points
- Software development [1]  
 Module specifications developed/refined  
 Code produced  
 Test plans produced  
 Testing carried out  
 [1] for each of **three** points
- Review [1]  
 System evaluated by users  
 Meetings between developers and users/users provide feedback  
 Agreement on actions required  
 [1] for each of **three** points
- [4] for each of **two** stages [8]

QWC

**Total**

AVAILABLE  
MARKS

14

4

**90**

## Quality of Written Communication (QWC) in GCE Mark Schemes

The assessment of quality of written communication.

Marks are to be allocated to QWC in accordance with the following criteria.

<b>Performance Level</b>	<b>Criteria</b>	<b>Marks</b>
Threshold	Candidates spell, punctuate and use the rules of grammar with reasonable accuracy; they use a limited range of specialist terms appropriately.	0, 1
Intermediate	Candidates spell, punctuate and use the rules of grammar with considerable accuracy; they use a good range of specialist terms with facility.	2, 3
High	Candidates spell, punctuate and use the rules of grammar with almost faultless accuracy; deploying a range of grammatical constructions; they use a wide range of specialist terms adeptly and with precision.	4



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## **Information and Communication Technology**

**Assessment Unit AS 2**

*assessing*

**Module 2: Components of Information  
and Communication Technology**

**[ASW21]**

**FRIDAY 23 JANUARY, MORNING**

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**MARK  
SCHEME**

1 (a) As the stick is moved forwards/backwards/left/right  
 ... the movement is detected by sensors/switches  
 ... which detect the  $x$   
 and  $y$ -coordinates of the stick  
 A sensor detects the depression of the button  
 The signals from the sensors are input to the computer  
 AD conversion may be used  
 [1] for each of **four** points [4]

(b) The stick can be moved in a more natural/intuitive way to control  
 movement  
 ... than continually pressing “arrow” keys on a keyboard  
 [1] for each of **two** points

The user only needs to learn how to move a stick and press a button  
 ... compared to mastering all/most of the keys on a keyboard  
 [1] for each of **two** points

Feedback possible via joystick  
 ... for a more realistic environment  
 [1] for each of **two** points

[2] for each of **two** advantages [4]

8

2 (a) To hold the database software  
 ... while the teacher is using it/while it is being executed  
 [1] for each of **two** points

To hold data entered by the teacher/data read by the computer from the database  
 ... temporarily/before it is stored in the database/while it is modified  
 [1] for each of **two** points

To hold the bulk of the O.S.  
 ... while the computer is running  
 [1] for each of **two** points

[2] for each of **two** ways [4]

(b) To hold the database software  
 ... “permanently”/while the computer is switched off/where it has  
 been installed/from where it is loaded into RAM when needed  
 [1] for each of **two** points

To hold the database itself  
 ... “permanently”/while the computer is switched off/where it has  
 been saved/from where it is read into RAM when needed  
 [1] for each of **two** points

		AVAILABLE MARKS
	<p>To hold the O.S.  ... from where it can be loaded into RAM  [1] for each of <b>two</b> points</p> <p>[2] for each of <b>two</b> ways</p>	[4]
	<p>(c) To store the BIOS/kernel of the operating system  ... permanently/so that it is always available  available for bootstrapping/booting up  [1] for each of <b>three</b> points</p>	[3]
<b>3</b>	<p>(a) A WAN is used to connect computers over a wide geographical area  ... while the computers in a LAN need to be in the same building  [1] for each of <b>two</b> points</p> <p>(b) To prevent computers on the network from outside attack  ... from being hacked into  ... by a virus  [1] for each of <b>two</b> points</p> <p>To filter data  entering the network  ... and prevent the receipt of spam  offensive material  [1] for each of <b>two</b> points</p> <p>[2] for each of <b>two</b> reasons</p>	[2]
	<p>(c) To speed up network traffic  ... by caching pages or files that are requested most often  [1] for each of <b>two</b> points</p> <p>To filter data  entering the website  ... to block access to certain websites  enforce an acceptable use policy for employees  [1] for each of <b>two</b> points</p> <p>[2] for each of <b>two</b> points</p>	[4]
	<p>(a) To ensure that data is meaningful/reasonable/complete/sensible/  conforming to rules  ... before being input/processed  ... as an automatic/computerised process  [1] for each of <b>two</b> points</p> <p>(b) Format check/input mark [1]  The Date of birth must be in the form ddmmyy [1]</p>	[2]
		11
		10

Presence check [1]  
The Surname must be supplied [1]

Length check [1]  
The Date of birth must be exactly 6 characters long/the Surname must fit into the space allocated on the screen [1]

Type check [1]  
The Surname must contain only characters/the Date of birth must contain only digits [1]

Range check [1]  
... the day must be in the range 1 to 31/month  
in the range 1 to 12

[2] for each of **two** checks [4]

(c) To confirm that input data is as intended/using double entry/proof reading [1] for each of **two** points [2]

(d) The user proofreads the screen/connects the data/uses the clear button ... and then clicks the next button [1] for each of **two** points [2]

10

5 (a) Data is gathered/stored as a group ... perhaps off-line ... and processed when convenient ... usually during an off peak period/overnight All the data undergoes the same processing/similar data ... with minimum/no human involvement There is usually a large volume of data [1] for each of **four** points [4]

(b) There is absolutely no delay in processing/immediate processing Data is processed fast enough for an input ... to influence the next input ... or transaction ... or the state of the system The output will influence the next input [1] for each of **four** points [4]

(c) Example Payroll This a regular monthly process [1] + [1] [2]

(d) Example ATM transactions A cash withdrawal must be applied to the balance before another withdrawal can be made [1] + [1] [2]

12

<p><b>6 (a)</b> The user uses a pointer ... or keys in a number/letter ... to select from a list of options from a pop up/pull down menu ... each/some of which may lead to a list of sub-options [1] for each of <b>three</b> points</p> <p>The user keys in a string/word ... following an exact syntax ... at a prompt The command may contain parameters/switches One command is usually List/Help which lists all valid commands [1] for each of <b>three</b> points</p> <p><b>(b)</b> The Print menu is selected ... from the Main menu The user selects/browses to the file location ... and keys in the number of copies ... in a dialogue box [1] for each of <b>three</b> points</p> <p>The user keys in the PRINT command ... followed by the name/pathname ... and extension of the file ... and the number of copies [1] for each of <b>three</b> points</p>	<p>[6]</p> <p>[6]</p>	<p>12</p>
<p><b>7 Name</b> String A name consists of a sequence of alphabetic characters/letters [1] + [1]</p> <p><b>Age</b> Integer An age can be counted/enumerated/is a whole number [1] + [1]</p> <p><b>Home owner</b> Boolean There are only two possible answers/values [1] + [1]</p> <p><b>Income</b> Currency An income is a sum of money [1] + [1]</p>	<p>[8]</p>	<p>8</p>
<p><b>8 (a)</b> A key field uniquely identifies a row in a table Example AlbumID or SongID [1] + [1]</p> <p>A composite key is made up of two keys Example SongID + AlbumID [1] + [1]</p>	<p>[4]</p>	

- (b) **Table 3** provides the link  
 It links each song  
 ... with the album it is on  
 There is a 1:m link between Tables 1 and 3  
 There is a 1:m link between Tables 2 and 3  
 [1] for each of **three** points [3]
- (c) The librarian will create/use a query  
**Table 3** will be searched for a composite key where the AlbumID is  
 the required one  
 The SongID of each of these composite keys will identify the song  
 in **Table 2**  
 ... where its title/name can be found  
 [1] for each of **three** points [3]
- (d) The librarian will create/use a report from a query  
**Table 1** will be searched to find the AlbumIDs  
 ... of all albums by the artist  
**Table 3** will be searched to find the SongIDs  
 ... of all the songs on each album  
**Table 2** will be used to get the title/name of each song  
 [1] for each of **five** points [5]

QWC

**Total**

AVAILABLE  
MARKS

15

4

90

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