Published Mark Scheme for
GCE AS Information and Communication Technology

Summer 2010

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

MARK SCHEMES (2010)

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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[AW111]

MONDAY 24 MAY, MORNING

MARK SCHEME

1 **(a)** A data source designed and used for a specific purpose
The questionnaire – it is designed to discover shopping preferences
[1] for each of **two** points [2]

(b) Benefit
It can be very cost effective
…as the data has already been collected/processed/paid for
[1] for each of **two** points

It should be immediately available
…as the data has already been collected using the data source
[1] for each of **two** points

[2] for **one** benefit

Drawback
The source was designed for a different purpose
…so it may not provide exactly the data required/additional filtering or processing may be required
[1] for each of **two** points

[2] for one drawback [4]

(c) Presence check
This is used with a field that is mandatory/compulsory/required
The first name/surname/email address must be supplied
[1] for each of **two** points

Range check
This is used with a field whose value must lie within a lower and upper limit
The <u>day</u> in the DOB must lie in the range 1 to 31 inclusive/<u>month</u> in the range 1 to 12 inclusive/<u>year</u> in the range e.g. 00 to 99
[1] for each of **three** points

Format check
This is used with a field whose characters must comply with a preset pattern/picture
The email address must consist of a local-part, an @ sign and a domain/hostname
[1] for each of **two** points [6]

(d) (i) **Purpose**
To check that the data which has been entered/input
…is as intended/matches the source data
[1] for each of **two** points [2]

(ii) Double entry
The email address must be entered twice
[1] for each of **two** points

Proofreading
The user must confirm that the data is as intended by clicking the Save button
[1] for each of **two** points [4]

(e) (i) Data consists of raw facts or figures
…which have no context/meaning
Any suitable example: '40 on its own is just a number.'
[1] for each of **two** points [2]

(ii) Information
This is data with a context or meaning
Example: 40 is the percentage who have selected Health & Beauty
[1] for each of **two** points

Knowledge
This is the application of information
Example: The retailer might decide to introduce Health & Beauty products as this is the product most people are likely to purchase
[1] for each of **two** points [4]

(f) The ITU is a world-wide organisation/United Nations agency
It coordinates governments and private organisations
It regulates the use of the radio spectrum throughout the world
It assigns communication satellite orbits
It establishes standards for a range of communication systems
It organises meetings and exhibitions
[1] for each of **four** points [4]

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2 (a) Bus network
All computers are connected to a single cable or backbone
Data travels from the source in both directions along the bus
A terminator is positioned at each end of the bus cable to prevent the signal from bouncing back
A computer sending data identifies the recipient
Each computer on the bus network checks if it is the intended recipient
If it is, the computer accepts the data
If it is not, the computer ignores the data
The CSMA/CD protocol is used
[1] for each of **three** points

Start network
All computers/work stations/node are connected to a central hub/computer
Each computer is connected directly to the hub
Data travels from the source to the central hub
…which boosts/repeats/rebroadcasts the data signal
…and sends it directly to the intended recipient
[1] for each of **three** points [6]

(b) <u>Firewall</u>
Filters all messages entering
…and leaving the network
It examines each message and blocks those that do not meet security criteria
It prevents unauthorised external access
It prevents unauthorised internal access
It prevents malicious access
It prevents virus attacks/hacking
It may act as a router, forwarding packets between the LAN and the Internet
[1] for each of **two** points

<u>Switch</u>
Acts as a traffic control centre for the LAN
When the switch receives a data packet,
…it reads the address from the header
The data packet is then routed to the destination
[1] for each of **two** points

<u>Proxy server</u>
Intercepts all requests to the Internet
…to see if it can meet the request
If not, it forwards the request to the Internet
It stores recently used pages in (cache) memory
The proxy server may be used to filter requests
…to prevent employees from accessing specific Web sites
It hides the IP address from external access
[1] for each of **two** points   [6]

(c) <u>Hardware</u>
Web cam
Microphone
Loudspeaker
High resolution screen/data projector
High bandwidth cable/connection
[1] for each of **four** HW components

<u>Software</u>
Communication software enabling the sending and receiving of data over telephone
Image compression/decompression software to reduce file sizes during transmission
[1] for each of **two** SW components   [6]

(d) Attachments can be added to an email
…such as photos of the new product
[1] for each of **two** points

An address book can be created/maintained
…containing email addresses of their customers
[1] for each of **two** points
The same email can be sent to a number of users at the same time
The relevant customers can be selected and added to the "send" field
[1] for each of **two** points

The text of the email can be written in HTML
…allowing hyperlinks to a promotional website
[1] for each of **two** points

[2] for each of **three** features [6]

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3 (a) Access rights
Each authorised user is allocated specific access rights
Example: Read only
This allows the user to read a file but not modify it
Rights are identified in an access table
…which is checked by the DBMS whenever an user requests access
[1] for each of **three** points

Data encryption
Data is coded/translated
…before transmission
…by the application of a key/function/password
On receipt the data is decrypted/restored to plain text
…using the appropriate decryption key
Intercepted data is meaningless without possession of the key
[1] for each of **three** points [6]

(b) A username and password
…is allocated to each authorised user
The username is unique
The user is usually first given a default password
The password can be created/changed/selected by the user
Both are required for logging on
There may be a restriction on the number of attempts at the
password
[1] for each of **four** points [4]

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4 (a) CAD
The use of computer technology/software in the drafting/design stage
…of objects such as tools/machine parts/buildings/clothing/integrated
circuits/food
[1] for each of **two** points

CAM
The use of computer technology/software to control
…the production/manufacture of objects
…incorporating automatic tool changing
…such as drills, lathes, robots
…usually using the designs/digital models created by CAD
[1] for each of **two** points   [4]

(b) CAD
Increase in productivity/accuracy – electronic v manual
Use of templates/tool box of specialist shapes increases productivity/
quality
Designs can be edited electronically
Designs can be input directly into the CAM process
Manipulations such as 3D representations are possible
The design can be tested/evaluated before production
[1] for each of **two** benefits

CAM
Increase in productivity
…accuracy/precision
…consistency
Reduction in manpower levels/reduced wages costs
Can be reprogrammed – changes can be implemented by modifying
the program
[1] for each of **two** benefits   [4]

(c) In hazardous environments such as paint spraying
To assemble cars from components
To move car components from store to assembly line
To weld car components together
In the testing of car safety – crashes/crash test dummies
[1] for each of **four** points   [4]   12

5 **(a)** Technical documentation [1]
System requirements/user requirements
Data model/DFDs/ERDs/normalisation
Screen/report specifications/layouts
Code listings
Test plans/schedule/data/results
[1] for each of **two** points

User documentation [1]
Installation guide
Hardware and software requirements
User guide
Troubleshooting/FAQ section
[1] for each of **two** components   [6]

(b) <u>Application testing</u>
Performed by the developer
The software is tested against the system requirements
It includes module testing/integration testing/system testing
Test plans are followed/test data is used/valid/invalid/extreme data
Black box and white box testing are used
[1] for each of **three** points

<u>Acceptance testing</u>
Performed when the software is ready to be released/handed over to
the client/users/after application testing
Intended to give the end users the confidence that the software
meets their requirements
A group representing the end users tests the application
…using real world scenarios/data
The users report back/provide feedback on any problems
Eventually, the users sign off the software/complete the contract
[1] for each of **three** points   [6]

(c) To oversee/manage the development of the new system
To plan/schedule the project/set time scales
To manage the budget
To allocate resources – human, hardware, software
To monitor progress
To identify/respond to risk
To report to management/client
[1] for each of **three** points   [3]   15

6 (a) <u>ROM</u>
For permanent storage
…of the bootstrap/core OS
[1] for each of **two** points

<u>Cache memory</u>
To speed up the retrieval
…of recently used data
[1] for each of **two** points   [4]

(b) RAM [1]
For the temporary storage
…of current data
…and current software
[1] for each of **two** points   [3]

(c) (i) <u>Multi-tasking OS</u>
Allows the user to perform more than one task <u>at a time</u>
…i.e. run more than one application program at a time
Example: have a browser and word processing SW open at the same time
The OS must keep track of where the user is in these tasks
…and enable them to go from one to the other without losing data
The OS allocates storage and other resources accordingly
[1] for each of **three** points

<u>Multi-user OS</u>
Enables many users to run programs simultaneously
…from a few users up to thousands of users
The OS must make sure that the resources allocated to the current users are balanced
…so that each user has sufficient and resources
…while the overall performance of the system is satisfactory
Time slicing can be used
[1] for each of **three** points   [6]

(ii) <u>Presentation SW</u>
Allows the creation of slide shows
Slides can be based on standard templates/master slides
New templates can be created
Each slide can contain multimedia elements
Transition effects can be used for slide components
Transition effects can be used for the slide show
The slide show can be set to run automatically or controlled by the presenter
Speaker's notes can be included
[1] for each of **three** points

<u>Web authoring SW</u>
Allows the creation of pages for a web site
Provides a toolbox of components
Pages can be based on standard templates
New templates can be created
Each page can include multimedia components (text/images/ sounds/movie clips)
…and navigation links/hyper links
Creates the HTML code automatically
The HTML code can be edited
The page can be previewed
[1] for each of **three** points

Internet browser SW
Allows web pages to be viewed
Converts HTML code to a multimedia display
Provides a navigation bar/navigation buttons/refresh button
It provides a home page/button
…and page tabs
…a search engine
It records the history/favourites/bookmarks
Plugins can be added
Security levels can be set/filters applied
Accessibility can be customised
[1] for each of **three** points [9]

(d) Software for which the copyright to source code
…is in the public domain
No licence is required to use the code
Users can use/change/improve the software
…and redistribute it modified or unmodified
The software is usually developed in a public, collaborative manner
[1] for each of **four** points [4]

	26
+ QWC	5
Total	120

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.

Performance Level	Criteria	Marks
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, 5