Published Mark Scheme for GCE AS Information and Communication Technology

Summer 2009

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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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[AW111]

THURSDAY 4 JUNE, AFTERNOON

MARK SCHEME

AVAILABLE MARKS

1 (a) (i) Navigation buttons to move back/forward while browsing
Address bar used to enter internet address/URL
Search engine to allow search criteria to be entered
Bookmark buttons defined by the user that redirects to favourite websites
Keeps a history of recently visited pages
Refresh button to reload webpage
Home button to load the home page
Tabs to open a number of websites in a single window
Converts HTML code to display web page
[1] for each of **three** features [3]

(ii) The secretary would key the search criteria into the search engine
This would consist of key words (details) about the building
The secretary could then click on the matches/follow the links
The matches will be listed in order of relevance
The secretary could modify the search (refine/widen/narrow/use advanced search)
. . . using AND, OR, NOT
The secretary could specify the type of result – images/video/maps
[1] for each of **three** points [3]

(b) (i) Light (a laser) is passed over the newspaper cutting
. . . converting its light and dark areas into binary/digital data
The OCR software can distinguish between types of content – text, tables and photographs
The OCR program matches any text elements
. . . with an internal library of characters, letters, numbers, spaces, etc.
. . . to produce editable text
Images are stored as bitmaps/jpg . . .
[1] for each of **three** points [3]

(ii) Digital imaging/graphics software is used
This can alter the lightness/darkness of the photograph
. . . and the contrast
. . . and the colour saturation/hue/balance
. . . automatically/as defined by the user
Parts of the images can be copied/moved/deleted
The image can be cropped/re-sized
Filters/effects can be applied
Example: the image can be sharpened
Blemishes/dirt marks can be removed/blurred/cloned out
[1] for each of **four** points [4]

(iii) Rich Text Format
RTF documents can be read by most word processors and operating systems
Various text formatting properties
. . . such as bold characters and different typefaces
. . . as well as document formatting/structures/tables
. . . are encoded in a standard way
[1] for each of **three** points

				AVAILABLE MARKS
		Joint Photographic Experts Group JPEG is a standard image compression format . . . designed for compressing either a full-colour or gray-scale image . . . so that its file size is reduced JPEG is 'lossy' . . . the resultant image does not contain the same detail as the original . . . but it exploits the limitations of the human eye in detecting small colour changes The degree of 'lossiness' can be varied by adjusting compression parameters . . . so that file size can be traded against image quality [1] for each of **three** points	[6]	
	(c)	The draft article is prepared in electronic form/using a word processor The text of the accompanying letter is composed A topic is inserted into the subject box The draft article is attached The members email addresses will be selected from a contact list The message can be sent to all members at the same . . . or selected members [1] for each of **four** points	[4]	23
2	**(a)**	A direct data source is designed for a specific purpose The membership renewal form is intended to gather details about a member [1] for each of **two** points		
		An indirect data source's data is used for a purpose other than the one for which it was intended The membership details could be used for a mail shot/a survey/ passed to a third party (Any reasonable alternative use) [1] for each of **two** points	[4]	
	(b) **(i)**	To enable a human [1] . . . to check that input data matches the source document . . . is what was intended to be input . . . has been entered correctly [1] for each of **two** points	[2]	
	(ii)	To enable the computer/an automatic process [1] . . . to ensure that data is meaningful/reasonable/complete/ correct type/correct format/sensible/within a range [1] for each of **two** points	[2]	

			AVAILABLE MARKS
(iii)	**Type check** Surname [1] It should be alphabetic/contain the correct kind/sort of characters [1] for each of **two** points **Format check** Postcode [1] It should follow a particular syntax or picture/It should be 2 letters, 1 or 2 digits, a space, a digit and 2 letters [1] for each of **two** points **Check digit** Membership number [1] This is the only field in which one of the digits could be calculated from the other digits [1] for each of **two** points	[6]	
(c)	How up-to-date the data source is The information will not reflect the current situation Some data may have changed /Example: change of address [1] for each of **two** points How relevant the data source is The information may not include all the essential/required details The information may not include the wrong details The information may include unnecessary details [1] for each of **two** points How complete the data source is The information may omit essential details Example: Some fields may not have been completed [1] for each of **two** points How accurate the data source is The information may be incorrect/inaccurate Example: Invalid data in a field due to transcription error [1] for each of **two** points How well presented the information is It may not be appropriate for its intended audience Examples: Inappropriate format/lack of annotation/'the wrong type of chart' [1] for each of **two** points [2] for each of **three** factors	[6]	20

AVAILABLE MARKS

3 **(a)** A generic/general purpose solution
. . . or ready made/designed/readily available solution
. . . could be purchased 'off the shelf'
. . . from a computer store/specialist software shop/web site/downloaded
[1] for each of **three** points

Purpose-built/tailored/bespoke software
. . . could be developed 'in-house'
. . . by ICT specialists/programmers
. . . within the business
[1] for each of **three** points

Purpose-built/tailored/bespoke software
. . . could be 'out-sourced'
. . . to ICT specialists
. . . outside the business
Example: a software house
[1] for each of **three** points
[3] for each of **two** methods [6]

(b) **(i)** **Project Manager**
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

Programmer
To write the program code/use a programming language
. . . from the module specifications
To test the code
To debug the code
To document the code
To maintain the code
Produce program documentation
[1] for each of **three** points [6]

(ii) **Design**
Detailed design of user interface/switchboard/menus/screens
. . . output/reports
. . . the database structure/model/DFDs, etc.
. . . the test strategy/plan
Design of data capture forms
Process design, e.g. specification of queries
Specification of manual/clerical procedures
[1] for each of **three** points

					AVAILABLE MARKS
			Implementation The system is developed . . . from the technical specification Software/code produced Installation of the new system Testing of the overall system Staff training Changeover Data conversion [1] for each of **three** points		
			Testing The system is operated under controlled conditions and the results evaluated . . . to ensure it meets its objectives/requirements/identify errors/ faults/bugs Test data is used/a test plan is used Module/unit testing is carried out . . . and integration testing . . . and system testing Alpha/beta/acceptance/application testing is carried out The software is debugged [1] for each of **three** points	[9]	21
3	**(c)**	**(i)**	It is needed during the development of the system . . . so that the system can be developed to meet the system requirements . . . so that programmers/testers/developer understand how the system will be developed [1] for each of **two** points		
			It is needed during system maintenance . . . so that the system can be corrected/perfected/adapted to meet the user's requirements . . . so that programmers/testers understand how the system was developed/testers can refer to the test plan/the original testing can be replicated [1] for each of **two** points [2] for each of **two** reasons	[4]	
		(ii)	Overview of system/introduction to system The HW and SW configuration . . . installation instructions . . . a user guide . . . troubleshooting section/FAQ section . . . training materials [1] for each of **three** points	[3]	7

AVAILABLE MARKS

4 **(a)** A broadband Internet connection/modem [1]
To support a high-speed Internet connection/AD conversion [1]

A router/hub [1]
To communicate directly to the Internet connection
To communicate directly with each computer
[1] for **one** point

An adapter/card in each computer/WIFI/Bluetooth/transceiver [1]
To enable the PC to send/receive data without a physical connection/ send data to the router [1]
Software drivers for the wireless router/wireless adapters [1]
To configure/install the router/adapters [1]
A microfilter [1]
. . . to separate data signal from voice signal [1]

ISP [1]
To provide access to the WWW [1]
[2] for each of **three** resources [6]

(b) **IP address**
A unique number
. . . assigned to any device/computer connected to the Internet
An IP addresses consist of four numbers
. . . separated by full-stops/periods
(Alternative – Example: 123.45.67.254 for [2])
The computer processes this as a 32-bit pattern/four octets
The first octet identifies the network
The last octet identifies the actual computer on the network
[1] for each of **four** points

Firewall
A set of related programs/software/hardware
. . . which monitors/controls traffic entering/leaving the network
. . . to protect the network from unauthorised access/intrusion/ hackers/viruses
The firewall examines each network packet/message
. . . to determine whether to forward it toward its destination
. . . to comply with the network's security policy
[1] for each of **four** points

SMS
Enables a short text message to be sent between mobile phones/Short Message Service
The text messages can be up to 160 characters,
Messages can be received while making voice calls
Messages generated by SMS are immediately delivered directly to the recipient's phone/*recipients' phones*
If the recipient's phone is out of coverage, in use or turned off
. . . the service holds the message until the phone comes back into the area
[1] for each of **four** points [12]

				AVAILABLE MARKS
	(c)	Bluetooth wireless technology enables electronic devices to communicate without cables It operates over short distances/up to 100 meters It uses very little power It can be blocked by solid walls/is a 'line of site' method It uses radio waves (in the 2.4 Gigahertz range) [1] for each of **four** points	[4]	22
5	**(a)**	**(i)** **Paypal** . . . is a method of sending and receiving money online/ over the Internet It is a secure method It acts as an intermediary between buyer and seller . . . so that most of the buyer's details are withheld from the seller Fees are charged depending to whom you are sending funds [1] for each of **two** points		
		https Hypertext Transfer Protocol Secure A protocol . . . providing secure/safe Internet transactions/via a secure web site It is used when the information being communicated is sensitive/ confidential such as credit/debit card details It uses encryption . . . so that the information being transferred back and forth is encoded . . . and will be meaningless to any unauthorised parties [1] for each of **two** points	[4]	
		(ii) **Worm** A program which replicates itself from system to system . . . without the use of a host file Worms generally exist inside of other files A worm will pass on a document infected with a malicious macro . . . using up more and more energy [1] for each of **two** points		
		Logic Bomb A logic bomb lies dormant . . . until a specific piece of program code is activated A typical activator for a logic bomb is a date The logic bomb checks the system date and does nothing until a pre-programmed date and time is reached A logic bomb may wait for a certain message from its programmer . . . before executing its code [1] for each of **two** points	[4]	

AVAILABLE MARKS

(b) (i) Virtual reality allows the user to interact with an environment that exists only inside a computer/an artificial environment is created
It uses immersive technologies
. . . such as head-mounted displays/virtual reality helmets/ special gloves
. . . or a special room whose walls consist of screens/simulator
The computer creates a three-dimensional graphical environment
. . . from numerical data/sensors
. . . which sense the user's reactions and motions
The user can modify the synthetic environment
. . . creating the illusion of being part of the real environment/ receive feedback
Real-time processing is required
[1] for each of **four** points [4]

(ii) There is no need for a human patient [1]
This is safer as no human is put at risk
There is no need to wait on a suitable patient
[1] for **one** point

The surgical procedure can be repeated [1]
At any time
Many times
Variations/emergencies can be programmed in
New techniques can be practised
Feedback provided on the doctor's performance
[1] for **one** point
[2] for each of **two** benefits [4]

(c) Computer Misuse Act
Unauthorised access to computer material is against the law
This offence covers using someone else's password to log onto their user area
. . . and even looking at their files
Unauthorised access with intent to commit or facilitate a crime is against the law
This offence covers gaining access to someone else's system with the sole purpose of doing something illegal.
Unauthorised modification of computer material is against the law
This offence also covers purposely introducing a virus into another person's computer system
[1] for each of **three** points

		AVAILABLE MARKS
Copyright, Designs and Patents Act Gives the creators of literary/dramatic/musical/artistic works/ sound recordings/broadcasts/films . . . rights to control the ways in which their material may be used . . . including broadcast and public performance, copying, adapting, issuing, renting and lending copies to the public The act refers to the intellectual property/ownership of software and associated documentation . . . in the same way as literary/artistic copyright Users need a licence to use copyrighted software It is against the Act to make copies/distribute unlicenced software [1] for each of **three** points	[6]	22
	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