**General Certificate of Secondary Education
January 2012**

ICT **45201**

(Specification 4520)

Unit 1: Systems and Applications in ICT

Final

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

To Examiners:

1. **When to award '0' (zero) when inputting marks on CMI+:**
   A mark of 0 should be awarded where a candidate has attempted a question but failed to write anything credit worthy.
   Insert a hyphen when a candidate has not attempted a question, so that eventually the Principal Examiner will be able to distinguish between the two (unattempted/nothing credit worthy) in any statistics.

2. This mark scheme contains the correct responses which we believe that candidates are most likely to give. Other valid responses are possible to some questions and should be credited. Examiners should refer to a Team Leader off-mark scheme responses that they believe are creditworthy.

1	(a)		digital camera tracker ball graphics digitiser joystick/games controller keyboard/keypad bar code (reader) light pen graphics tablet mouse laser pen sensor touch screens/pad scanner microphone concept keyboard skype phone web cam **Any 2 x 1 mark**	2

1	(b)		printer (or any named printer e.g. laser printer) Two named printers – 1 mark each monitor/screen/VDU plotter speakerheadphones skype phone **Any 2 x 1 mark**	2

1	(c)		memory stick/pen drive/USB drive/stick/pen (**Not just USB)** hard disk (drive) zip disk (drive) CDR (drive) or DVD-R CD-RW (drive) or DVD-RW RAM memory/flash card dat tape/Magnetic tape (drive) MP3 player/iPod digital projector **NOT** just CD or disk **Any 2 x 1 mark**	2

1	(d)		Central Processing Unit **Correct Answer Only**	1

1	(e)		Ram is volatile, ROM is not volatile **Correct Answer Only**	1

1	(f)		Sound Card Video card Graphics card Motherboard Fan CD-ROM drive etc. **ALLOW** other sensible **device** **Any 1 x 1 mark**	1

1	(g)		**Hardware** – **physical** parts/devices/components that make up a computer (system) Not just a single example e.g. monitor without explanation **Any 1 x 1 mark** **Software** – programs/set of instructions **Any 1 x 1 mark**	1 1

2	(a)	(i)	**D** (File Server)	**Correct Answer Only**	1

2	(a)	(ii)	**B** (Dial-up modem)	**Correct Answer Only**	1

2	(a)	(iii)	**A** (Broadband)	**Correct Answer Only**	1

2	(b)		LAN – Local Area Network	**Correct Answer Only**	1
			WAN – Wide Area Network	**Correct Answer Only**	1

2	(c)		LAN – limited to a small area (house/building etc.) WAN – worldwide **OR Allow** LAN – usually cables/hardwired (1) WAN – wireless/satellite (1)	1 1

2	(d)		A company that offers Internet access to customers for a fee **Correct Answer Only**	1

3	(a)		**Cheap** Easily **portable** Increasing **capacity**/can store 'lots' of data Used on a **wide range** of computers/machines **Robust**/not easily damaged or broken Any 2 x 1 mark	2

| 3 | (b) | | Byte
Kilobyte
Megabyte   1 mark for these 3 in order
Gigabyte
Terabyte

NB if largest to smallest - 1 mark for first and last correct
Terabyte
Gigabyte
Megabyte   1 mark for these 3 in order
Kilobyte
Byte

                           (Max 2 marks for this) | 1

1

1 |

| 3 | (c) | | The file might be **very large**/slow down the transfer
The file might be too large to be saved on the receiving machine
File size may be limited if sent by e-mail
Allow to large/big t transfer
                           Any 1 x 1 mark | 1 |

| 4 | (a) | | A14   **Correct Answer Only** | 1 |

| 4 | (b) | | Date   **Correct Answer Only** | 1 |

| 4 | (c) | (i) | =B5*C5   **Correct Answer Only** | 1 |

| 4 | (c) | (ii) | =D20-D12   **Correct Answer Only** | 1 |

| 4 | (d) | | AVERAGEUP   **Correct Answer Only** | 1 |

| 4 | (e) | | ROUND – will 'round' to the **nearest digit** (allow whole number) asked for (will round up or down depending on the following digit)
Example (enough to gain the mark if correct) e.g.– 12.434 using ROUND to 2 decimal places gives **12.43**

ROUNDUP – will always round **up** to the next highest digit (allow whole number) asked for
Example (enough to gain the mark if correct) – 12.434 using ROUNDUP to 2 decimal places gives **12.44** | 1

1 |

| 4 | (f) | | **1. Check/look/see** if the **cost in D21**/Profit (visual or validation)
2. Reduce cost/number in……….. (b5 – b7 or c5 to c7)
OR **increase the number sold or selling price.** (b16 – b18 or c16 to c18)
3. Cells linked by formulae so the **profit will change automatically**
4. Set up a 'routine' in D21 to say profit is above …?
5. **Repeat steps 1 and 2 until cost in D21** is (Ok / acceptable)
Allow Goal seeker solutions that cover these points
Goal seek by itself scores 1 (2nd mark from above possible)
                         Any 2 x 1 mark | 2 |

5	(a)		Create **folders** for each subject More **meaningful/sensible/appropriate file names** **Delete** unwanted/needed files Sort folders by .... name/date etc. Use **versions** of file names **Any 2 x 1 mark**	1 1

5	(b)		(use of) colour (use of) sound (use of) images/pictures/graphics/icons (not design/draw) menus windows/pointers position of items on screen/easy to navigate help facilities house style user friendly/easy to use **Any 3 x 1 mark**	3

6	(a)		**J** **Correct Answer Only**	1
6	(b)		**F** **Correct Answer Only**	1
6	(c)		**O** **Correct Answer Only**	1
6	(d)		**P** **Correct Answer Only**	1
6	(e)		**A** **Correct Answer Only**	1

7	(a)		**No address** given to return the form Box not **high/big** enough, so **cannot fill in details** Text **difficult to read/too small** **Too many different fonts** used (styles or sizes) Boxes **not in line** **Title** field **not in a suitable place** Favourite type of game – **too open/list/tick box** better **Other information** may be **needed** (e-mail address) **Any 3 x 1 mark**	3

7	(b)		Bar Codes **Correct Answer Only**	1

7	(c)		Text/call to telephone E-mail (not in data capture form) **Any 1 x 1 mark**	1

7	(d)		back/neck problems stress headaches/migraines possible radiation from monitors eye strain overheating epilepsy RSI – wrist/finger problems **Any 2 x 1 mark**	2

8	(a)	(i)	**Master Page** • Use as a **'template'** page • More **efficient/saves time** • **Saves time** repeating common processes on each page	

			• Can be used to create similar/repeat style **additional pages** **NOT** Home page	**Any 2 x 1 mark**	2

8	(a)	(ii)	**Navigation Bar** **Why** • Allows **faster/easier/simpler/smother** movement/ navigation around the site • Go to **any page without** having to return to the **'Home'** page • Positioned in the **same place**, adds **professional/ attractive/house style** look to page **Any 2 x 1 mark**		2

8	(a)	(iii)	**Counters** • See/know **how many people visited** the site **Why.** • Judge **popularity** of site/band • Used to **cost/promote/sell** advertising **Any 2 x 1 mark**		2

8	(b)		hotspot hyperlink/links templates layout guides marquees animation RSS feed forms Conversion to HTML	**Any 1 x 1 mark**	1

9	(a)		Software	**Correct Answer Only**	1

9	(b)		All of them	**Correct Answer Only**	1

9	(c)		The processing of data immediately upon receipt **Correct Answer Only**	1

9	(d)		Batch processing Interactive Multi-tasking Online Multi-user Allow Windows (any suitable)/ Mac (any suitable)/ DOS etc. **Any 1 x 1 mark**	1

10	(a)	(i)	Feasibility study	**Correct answer only**	1

10	(a)	(ii)	Design	**Correct answer only**	1

10	(a)	(iii)	Maintenance	**Correct answer only**	1

10	(a)	(iv)	Testing	**Correct answer only**	1

10	(a)	(v)	Evaluation	**Correct answer only**	1

10	(a)	(vi)	Analysis	**Correct answer only**	1

10	(b)		Interview Questionnaire/survey Observation Documentation	**Any 2 x 1 mark**	2

10	(c)		**Key points**
			   • **Plan**/carry out each stage
			   • **Review** each stage for **errors/changes/improvements**
			   • **Constant/regular reviewing**/looping
			   • **Feedback/changes** from review **fed back into earlier**/later stages
			   • **Repeat cycle** at each stage if needed
				Any 2 x 1 mark	2

11	(a)		They will save time by not having to travel to work each day
			               Correct answer only
			They will be able to work much more flexible hours
			               Correct answer only
				1
				
				1

11	(b)		Lack of **collaborative/sharing** ideas/problems More **easily distracted** from the tasks at hand Lack of **social contact** Less **easy to collaborate**/more **expensive to collaborate** **Extra home bills**/expenses **Slower hardware/connectivity** **Harder/slower** to **get help** if needed Work **longer hours/increase stress**	**Any 2 answers x 1 mark**	2

11	(c)	(i)	Copyright (Law)	**Correct answer only**	1

11	(c)	(ii)	Copyright (Law)	**Correct answer only**	1

11	(c)	(iii)	Computer Misuse (Act)	**Correct answer only**	1

11	(d)		**No rewardable material 0 marks** Not even 1 simple statement relating to possible advantages/disadvantages of online storage.	
			Lower mark range 1 – 2 marks There are simple (even vague) **statements** (1/2/3) relating to advantages/disadvantages online storage. These statements relate to suitable ideas/examples such as those given below.	
			Mid mark range 3 – 4 marks At least **one advantage and one disadvantage** need to be considered. There is evidence of **some understanding** shown through the use of **mostly correct** examples that **describe/give reasons** for a range (3) of advantages and disadvantages of online storage. Examples given are supported by some relevant description/reasoning. These examples will cover **a range** of ideas/examples such as those given below.	
			High mark 5 marks At least **one advantage and one disadvantage** need to be considered. There is evidence of a **clear understanding** shown through the use of **correct** examples that clearly **describe/give reasons** for a range (3) of advantages and disadvantages of online storage. Examples given are well supported by reasoned arguments. These examples will cover **several** of ideas/examples such as those given below.	
			Read the answer first before considering which level best fits the candidate's answer. **Examples** **Advantages** • **Saves money** - Less hardware/storage devices required • **World Wide Accessible** – online data can be accessed from anywhere in the world with just a computer and an internet connection. • **Share data/files** images with other staff working from home. • **Safety** – as the data is OFFSITE, data is more secure from theft, fire or any other damages that might happen to your local storage. **Disadvantage** • **Costs involved –** initial charge plus ongoing costs. • **Less control/flexibility** - Since the data is with a 3rd Party, you have less control over it than if it was stored locally • **Closure of Online Company** – this will cause lots of problems including security and retrieval of your data. • **Internet down/problems –** cannot access data/files • **Security** - Since data is online, the accessibility for it is global and so is the security threat. Any hacker will have access to the data as much as you have; only password or encryption to stop them	

12	(a)		**11**	**Correct answer only**	1

12	(b)		Not a unique identifier/two people have the same surname	1

12	(c)		Faster to enter data More accurate to enter data (as less data) Less storage space needed **Any 1 x 1 mark**	1

12	(d)		Typically, house number is not a field that involves calculations	

| | | | House could have a name rather than a number | 1 |
| | | | Allow text fields can include numbers   **Any 1 x 1 mark** | |

| 12 | (e) | (i) | GY0986, GY1003   **Correct answer only** | 1 |
| | | | Allow **any separator** and **any order** | |

| 12 | (e) | (ii) | GY1003, GY1029, GY1111   **Correct answer only** | 1 |
| | | | Allow **any separator** and **any order** | |

| 12 | (e) | (iii) | GY0340, GY1198, GY1201   **Correct answer only** | 1 |
| | | | Allow **any separator** and **any order** | |

| 12 | (f) | **No rewardable material 0 marks**
Not even 1 simple statement relating to or naming a method of data validation.
Lower mark range 1 – 2 marks
There are simple (even vague) **statements** (or just naming methods) relating to data validation. These statements relate to ideas/examples below.

Mid mark range 3 – 4 marks
There is evidence of **some understanding** shown through the use of **mostly correct** examples that **explain** the need/ways of validating data (2).
It should **be reasonably clear** that validation will check that the data is reasonable / sensible / valid / possible / acceptable.
Examples given are supported by some relevant description/reasoning. These examples will cover **a range** of ideas/examples given below.

High mark 5 marks
There is evidence of a **clear understanding** shown through the use of **correct** examples that clearly **explain** the need/ways of validating data(2)
It will be **clear** that validation with check that the data is reasonable / sensible / valid / possible / acceptable.
 Examples given are well supported by reasoned arguments. These examples will cover **several** of ideas/examples given below.

Read the answer first before considering which level best fits the candidate's answer.
Examples
• **Named examples** of validation – range check, presence check, type check, check digits, look-up lists or similar (**LMR 1-2 marks**)
• Clear explanation of how validation / at least 2 examples of validation would improve the accuracy of data being entered into the database (**Mid mark range 3-4 marks** or **HMR 5 marks**) | |

| 13 | (a) | | The item you buy will usually take longer to arrive
                                    Correct answer only | 1 |
| | | | You cannot inspect in detail the item you are buying
                                    Correct answer only | 1 |

13	(b)		• Cheaper/quicker in the long run because……..	
			○ Saves lots of their time travelling to the bank	
			○ Saves money on petrol and putting mileage on the car/ bus fare	
			○ Saves waiting in a queue in the bank	
			• Do not have to leave the house/travel/from comfort of their home	
			• Can complete transactions 24/7 not just when the bank is open	
			• Can access from 'anywhere'	
			• Can review transactions/transfer money etc. online	
			• Better deals available as you can search a wide range of accounts/banks available	
			NOT just cheaper or faster **Any 2 x 1 mark**	2

13	(c)		**Key elements**:	
			• websites	
			• allow users to create/build on-line **profiles**,	
			• **share information**, pictures, blog entries, music clips, etc.	
			• **'talk' /'speak' online**	
			• can be related to a shared interest	
			• build social relationships between members/ stay in touch/add friends	
			Any 3 x 1	3

13	(d)	**No rewardable material 0 marks**
		Not even 1 simple statement relating to possible software or hardware features used to help people with disabilities access ICT systems.
		Lower mark range 1 – 2 marks
		There are simple (even vague) **statements** (1/2/3) relating to software and/or hardware features used to help people with disabilities access ICT systems. These statements relate to ideas/examples.
		Mid mark range 3 – 4 marks
		At least **one software and one hardware feature** needs to be considered. There is evidence of **some understanding** shown through the use of **mostly correct** examples that **describe** a range (3) of software and hardware features used to help people with disabilities access ICT systems. Examples given are supported by some relevant description/reasoning. These examples will cover **a range** of ideas/examples.
		High mark 5 marks
		At least **one software and one hardware feature** needs to be considered. There is evidence of a **clear understanding** shown through the use of **correct** examples that clearly **describe** a range (3) of hardware and software features. Examples given are well supported by reasoned arguments. These examples will cover **several** of ideas/examples.

Read the answer first before considering which level best fits the candidate's answer.

Lots are possible. Below are a few examples;

Hardware

1. **Specialist Input devices** e.g. eye tracking devices, head movement devices, voice recognition, large tracker balls, large keyboards, concept keyboard/pictures used as input, Braille keyboards, touch screen devices, foot operated pointing device and many more.
2. **Specialist Output devices** e.g. Braille printers, voice output, high contrast monitor imaging, etc.

Software

1. Software that adapts hardware e.g. 'SharpKeys' that turns off selected keys.
2. Word-prediction software (reduce keystrokes)
3. Software in Windows already e.g. slow keyboard repeats etc.
4. Range of specialist software 'tailored' to individual disabilities.

- **Stated examples** would only gain a limited number of marks (**LMR 1-2 marks**)
- A **description** of how at least 3 features would help people with disabilities access ICT systems would gain high marks (**HMR 5 marks**)

14				
	Qu14	**No rewardable material**		**0 marks**

Level 1 Lower mark range

Subject Criterion Context
There are simple statement(s) about emerging technologies or at least one possible **effect** of how emerging technologies affect the way in which people and/or organisations operate and work together .This will usually be one valid **effect**. Examples are supported by very limited descriptions.

Quality of Written Communication
The candidate has used a form and style of writing which has **many** deficiencies. Ideas are not **often** clearly expressed.
Sentences and paragraphs are **often** not well-connected or **at times** bullet points may have been used.
Specialist vocabulary has been used **inappropriately** or **not at all**.
Much of the text is **legible** and **some** of the meaning is **clear**.
There are **many** errors of spelling, punctuation and grammar but it should still be possible to understand **much** of the response.

1-3 marks

Level 2 Lower mid mark range

Subject Criterion Context
There is evidence of **some understanding or use** shown by looking at, at least one 'emerging technology' with examples of at least two valid **effects** of how emerging technologies affect the way in which people and/or organisations operate and work together.
This will usually be **at least two** valid effects. Examples are supported by limited descriptions.

Quality of Written Communication

		The candidate has used a form and style of writing which has **some** deficiencies. Ideas are not **always** clearly expressed. Sentences and paragraphs may **not** be well-connected or **at times** bullet points may have been used. Specialist vocabulary has been used on a **limited** number of occasions. **Most** of the text is **legible** and **some** of the meaning is **clear**. There are **some** errors of spelling, punctuation and grammar but it should still be possible to understand **most** of the response.	**4-6 marks**
		Level 3 Higher mid mark range **Subject Criterion Context** Both **people and organisations** need to be considered. There is evidence of a more **developed understanding** shown through the use of **suitable** examples that **describe** more than two **effects** of how emerging technologies affect the way in which people **and** organisations operate and work together. Examples are supported by suitable descriptions. **Quality of Written Communication** The candidate has **mostly** used a form and style of writing **appropriate** to purpose and has expressed some complex ideas **reasonably clearly** and **fluently**. The candidate has usually used **well linked** sentences and paragraphs. Specialist vocabulary has been used on a number of occasions but **not always appropriately.** Text is **legible** and **most** of the meaning is **clear**. There are **occasional** errors of spelling, punctuation and grammar.	**7-9 marks**
		Level 4 High mark range . **Subject Criterion Context** Both **people and organisations** need to be considered. There is evidence of a **clear understanding** shown through the use of **relevant** examples that **discuss** more than two **effects** of how emerging technologies affect the way in which people and organisations operate and work together. Examples are well supported by reasoned arguments. **Quality of Written Communication** The candidate has selected and used a form and style of writing **appropriate** to purpose and has expressed complex ideas **clearly** and **fluently**. Sentences and paragraphs follow on from one another clearly and coherently. Specialist vocabulary has been used **appropriately** throughout. Text is **legible** and the meaning is **clear**. There are **few** if any errors of spelling, punctuation and grammar.	**10-12 marks**
		Quality of Written Communication Skills The candidate's quality of written communication skills will be one of the factors influencing the actual mark an examiner will give within a level of response. The quality of written communication skills	

		associated with each level is indicated above	
		Read the answer first before considering which level best fits the candidate's answer. Consider the 'emerging technology' given - any suitable. Then look for suitable statements/descriptions/discussion. Ideas (including 'emerging technologies' and possible effects) are given below. **Some possible areas;** • Wide range of **very recent** 'emerging technologies • **Teleworking (in all its forms) –** home-based, mobile, telecentres, • **Online buying/shopping** – 24/7 society, home deliveries • **Increased flexibility**, flexible hours, home working • **Size of workforce,** jobs loss because of introduction of ICT (unemployment), new jobs being created, mainly in ICT. • **Location of workplace**, centralised, out of town, home working, mobile computing. • **Change in jobs,** as with size of workforce but also training and retraining issues. Plus job satisfaction, ease of tasks etc • **Video conferencing -** work together from anywhere in the world/home (Internet). Can communicate/collaborate from anywhere in the world. • **Share resources** - from anywhere (online storage) • **Less face to face** communication.	

15	Qu15	No rewardable material	0 marks
		Level 1 Lower mark range **Subject Criterion Context** There are simple statements about at least one possible **hazard or method of avoiding** the hazard. This will usually be one/two valid **hazard/method of avoiding the hazard**. These statements are limited but would refer to possible hazards such as those outlined below. **Quality of Written Communication** The candidate has used a form and style of writing which has **many** deficiencies. Ideas are not **often** clearly expressed. Sentences and paragraphs are **often** not well-connected or **at times** bullet points may have been used. Specialist vocabulary has been used **inappropriately** or **not at all**. **Much** of the text is **legible** and **some** of the meaning is **clear**. There are **many** errors of spelling, punctuation and grammar but it should still be possible to understand **much** of the response.	1-3 marks
		Level 2 Lower mid mark range **Subject Criterion Context** There is evidence of **some understanding** shown by giving examples of at least two valid possible **hazards and limited methods of avoiding** the hazards. Examples are supported by limited descriptions.	

		Quality of Written Communication The candidate has used a form and style of writing which has **some** deficiencies. Ideas are not **always** clearly expressed. Sentences and paragraphs may **not** be well-connected or **at times** bullet points may have been used. Specialist vocabulary has been used on a **limited** number of occasions. **Most** of the text is **legible** and **some** of the meaning is **clear**. There are **some** errors of spelling, punctuation and grammar but it should still be possible to understand **most** of the response.	**4-6 marks**
		Level 3 Higher mid mark range **Subject Criterion Context** There is evidence of a more **developed understanding** shown through the use of **suitable** examples that **describe** more than two possible **hazards and methods of avoiding** the hazards. Examples are supported by suitable descriptions. **Quality of Written Communication** The candidate has **mostly** used a form and style of writing **appropriate** to purpose and has expressed some complex ideas **reasonably clearly** and **fluently**. The candidate has usually used **well linked** sentences and paragraphs. Specialist vocabulary has been used on a number of occasions but **not always appropriately.** Text is **legible** and **most** of the meaning is **clear**. There are **occasional** errors of spelling, punctuation and grammar.	**7-9 marks**
		Level 4 High mark range . **Subject Criterion Context** There is evidence of a **clear understanding** shown through the use of **relevant** examples that **discuss** more than two possible **hazards and describe methods of avoiding** the hazards. Examples are well supported by reasoned arguments. **Quality of Written Communication** The candidate has selected and used a form and style of writing **appropriate** to purpose and has expressed complex ideas **clearly** and **fluently**. Sentences and paragraphs follow on from one another clearly and coherently. Specialist vocabulary has been used **appropriately** throughout. Text is **legible** and the meaning is **clear**. There are **few** if any errors of spelling, punctuation and grammar.	**10-12 marks**
		Quality of Written Communication Skills The candidate's quality of written communication skills will be one of the factors influencing the actual mark an examiner will give within a level of response. The quality of written communication skills associated with each level is indicated above	
		Read the answer first before considering which level best fits the	

candidate's answer.

Some possible examples

Hazards – a wide range of online hazards are possible. Including;

- Phishing/scam e-mails
- Mirror-image (look alike) websites
- Spyware
- Viruses
- Hacking
- 'Stay safe' issues

Methods of avoiding

- Don't download from unknown sources
- Treat all e-mail attachments as suspicious
- Use firewalls (hardware/software)
- Virus protection/anti-virus software
- Web browser security – maximise or change
- Block pop-ups
- Keep software up-to-date
- Keep wireless networks secure
- Follow 'stay safe' guidelines