GCSE MARKING SCHEME

SUMMER 2016

ICT - UNIT 3
4333/01

INTRODUCTION

This marking scheme was used by WJEC for the 2016 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

1	Award 1 mark for correct device x 3 Award 1 mark for correct input/output method x 3 e.g. – Mouse and Input, Monitor and Output **NOT** keyboard – Input **NOT** touch screen or other devices that are both input AND output	3 3	6
2a	Award 1 mark per response. Musical Instrument Digital Interface / MIDI Musical instruments produce analogue signals (1), which have to be <u>converted</u> into <u>digital</u> signals for the computer to process(1).	1 1 1	1 2
2b	Award 1 mark per point: Any **three** of: • Can use music editing tools (e.g. autotuning, change tempo, change volume level, overlay tracks, layering, enveloping, sound effects, cropping, filters, looping, join two clips together, splicing etc. • Instruments can be recorded and the music converted into musical score • Allows the user to print their own music • Cheaper to produce music than to hire a music studio / service / facilities • Allows music to be stored <u>digitally</u> • Can use different instruments without having to purchase them • No need to be able to play an instrument to compose music. • Music files can be compressed (to save memory / faster transmission)	1 1 1	3
2c	Award 1 mark per response True (1) False (4) True (5)	1 1 1	3
3a	Award 1 mark per response **Transitions:** animated effect when moving from one slide to another **Timings:** controls speed/duration of animations / transitions/slide on screen **Bookmarks:** link from one part of a presentation to another	1 1 1	3
3b	Award 1 mark per response. Any **one** of: • Record a narration before you run a presentation to allow the audience to view the slideshow without the presenter being there / save the presenter having to speak. • Record a narration during a presentation and include audience comments in the recording. • Can choose the language required for a multilingual audience • Enables visually impaired people to follow the presentation • Record speaker's notes/expand on slide content	1	1

3c	Award 1 mark per response. Any **two** of: • They ensure corporate <u>house style</u>/ consistency throughout the slideshow • They ensure consistent navigation • <u>Saves time designing</u> the slideshow/ they supply the structure/ layout of the slideshow • <u>Saves time producing</u> each the slides/ all the developer has to do is to fill in their own content • Helps <u>novice</u> users produce a slideshow. **NOT** faster/easier by itself **NOT** 'saves time' by itself -needs qualification. **NOT** just 'professional', must qualify why	1 1	2
3d	Award 1 mark per response. Any **two** of: • Technical difficulties or lack of sufficient hardware / can require a lot of memory • People concentrate more on the presentation than what the presenter is saying /people get distracted by animations/over use of animations • Compatibility issues with software versions • Can lead to poor delivery techniques • "Death by PowerPoint", disengagement **NOT** hard to use/ requires training. **NOT** 'costs' **NOT** must have a computer	1 1	2
4	Award 1 mark for correctly named HCI x 2 Award 1 mark for correct advantage x 2 Award 1 mark for correct disadvantage x 2 **Do NOT award credit for answers where the advantage of one is a disadvantage of the other.** <u>HCI names</u> • Menu driven • Voice recognition / command / speech synthesis/voice driven • Command line / CLI • Biometrics • Touch sensitive	2 2 2	6

<u>Menu driven</u>

Advantages:
- No need to learn a lot of commands
- Ideal for beginners – everything is in a logical place/order
- Little processing power needed
- Extremely easy to use. Someone who has never seen the interface before can work out what to do
- Step-by-step options are given so that the user doesn't have to remember anything
- Menu interfaces don't have to be visual, they can be spoken - good for telephones or for visually impaired people

Disadvantages:
- Poorly designed menu interface may be slow to use
- It can be irritating if there are too many menu screens to work through - users get annoyed or bored if it takes too long
- You often can't go to the exact place you want right at the start. You have to work your way through the menu screens even if you know where you want to get to
- If the menu isn't organised properly it could cause frustration trying to find things
- Can be tedious for experts

<u>Voice recognition</u>

Advantages:
- Speech input is much faster than keyboard input NOT writing in
- No need to learn to type
- Less danger of RSI
- Reduces typing mistakes such as spelling / hitting wrong key
- Keyboard takes up room on the desk
- Faster to issue commands (e.g. open word processor)
- People with a disability that prevents typing can use speech input / helps with dyslexia
- Users can do something else with their hands
- Increased security (setting a voice password) NOT just recognise the user

NOT No training required
NOT quicker, faster without qualifying

Disadvantages:
- It takes a long time to train the computer to understand how someone speaks
- Background noise interferes with speech recognition – cannot use computer with music in background
- Unable to have a chat or use telephone and perform input at same time
- Computer will never know all the proper nouns or technical terminology
- Will not understand user when they have a speech impediment, sore throat or cold NOT accept ill or reference to illness which does not affect voice.
- Will not understand user when they have a strong accent
- Will always need a keyboard for special keys e.g. function keys, ctrl, alt / to make alterations / as a backup if the voice recognition system fails
- Can't use in a quiet environment like library or quiet train
- Can't keep private as people can hear what you are saying so no good for entering passwords
- May not recognise words that sound the same such as 'too' and 'two'

Command line

Advantages:
- Quicker to type commands (NOT 'quicker' must be qualified)
- Little memory needed
- Little processing power needed
- No need for expensive hardware
- If the user knows the correct commands then this type of interface can be much faster than any other type of interface
- This type of interface needs much less memory (RAM) in order to use it than other user interfaces
- This type of interface does not use as much CPU processing time as others
- A low resolution, cheaper monitor can be used with this type of interface

Disadvantages:
- For someone who has never used a CLI, it can be very confusing
- Commands have to be typed precisely. If there is a spelling error the command will fail
- There are a large number of commands which need to be learned
- You can't just guess what the commands might be and you can't just 'have a go'.

Biometrics

Advantages:
- Each individual has unique biometric characteristics, e.g. unique fingerprints, unique retina.
- It is difficult to forge biometric properties
- A biometric property of an individual cannot be lost
- Biometric properties cannot be shared
- Eliminate problems caused by lost IDs or forgotten passwords
- Reduce password administration costs
- Replaces hard to remember passwords which may be shared or observed by others

Disadvantages:
- Very expensive technology
- If biometric data is stolen a fingerprint cannot be changed
- Security issues with storing biometric data
- Biometric identification systems undermine privacy
- For people affected with diabetes, the eyes get affected resulting in differences

Touch sensitive

Advantages:
- A touch screen is very intuitive
- Easy to use as the user simply touches what they see on the display
- Save space as no keyboard or mouse is required
- Touch monitors can even be mounted on the wall
- Touching a visual display of choices requires little thinking and is a form of direct manipulation that is easy to learn
- Touch screens are the fastest pointing devices
- Touch screens have easier hand eye coordination than mice or keyboards
- No extra work space is required as with other pointing devices

Disadvantages:
- Difficult for people with accessibility issues: no feedback
- Can be easily damaged/scratched
- Dirty screens difficult to read
- Users must be within arm's reach of the display
- It is difficult to select small items
- User's hand may obscure the screen
- Screens need to be installed at a lower position and tilted to reduce arm fatigue
- Some reduction in image brightness may occur
- They cost more than alternative devices

5a	Award 1 mark per point. Any **two** of:		2	
	- Zoom - Selection - Transforming - Sizing/enlarge/reduce size - Crop - Copying - Moving - Cloning - Brush settings - Layering	- Red-eye - Spot clearing - Skew - Rotate - Distortion - Colour palette - Contrast - Brightness - Text *Accept any reasonable answer*		2
5b	Award 1 mark per point	1	2	

5b Award 1 mark per point

JPEG
Advantages:
- Smaller file sizes
- Quicker to download so suitable for webpages
- 24-bit colour, with up to 16 million colours / ideal for images that use more than 256 colours
- Rich colours, great for photographs that needs fine attention to colour detail

Disadvantages:
- Lossy compression - they tend to discard a lot of data / loss in quality
- After compression, JPEG tends to create artefacts
- Cannot be animated
- Does not support transparency

GIF
Advantages:
- Can support transparency
- Supports small animation effects
- Lossless compression – they contain the same amount of quality as the original (except of course it now only has 256 colours)
- Suitable for images with limited colours, or with flat regions of colour
- It is ideal for images that have large blocks of a single colour / A picture that has only a few colours could be saved in a smaller file size than a jpeg but have better quality.

Disadvantages:
- Only supports 256 colours
- Sometimes, the file size is larger than PNG
- Animated GIFs cannot be edited

BMP
Advantages:
- Pixel colours can be modified individually or as large groups
- Bitmap files may translate well to dot-format output devices such as printers

Disadvantages:
- Does not scale or compress well
- Large file sizes - not web friendly or mac friendly

6ai	Award 1 mark per point **Stop motion** is an animation technique where models are moved a small amount each time between taking photographs. When the frames are played back it appears as if the model is moving.	1	1
6aii	Award 1 mark per point Animators may make previous frames visible to help track the motion of an abject. This is called **Onion skinning**.	1	1
6aiii	Award 1 mark per point **Rotoscoping** is the technique of using a photograph and tracing each frame to create a life like motion.	1	1
6aiv	Award 1 mark per point An animator sometimes uses **Grouping** to combine separate objects to animate them at the same time.	1	1
6b	Award 1 mark per point. Any **two** of: • Story board • Mood board • Flip book • Time plan/line • Script	1 1	2
6c	Award 1 mark per point **Increase excessively:** If the frame rate is too fast it will blur the details of the animation **Decrease excessively:** A frame rate that is too slow will have a stop and start / jittery / jumpy / flickering / non-fluid effect **NOT** affect the size of your file/movie **NOT** will run faster/slower	1 1	2
6d	Award 1 mark per point Persistence of Vision/afterimage	1	1
7a	Award 1 mark per point. Any **three** of: • View account balances • Open savings account • Apply for overdraft • Apply for a mortgage • Apply for a credit card • View recent transactions • Download bank statements, for example in PDF format for printing • View images of paid cheques • Order cheque books • Order replacement cards • Transfer funds between the customer's accounts • Pay third parties, including bill payments (see, e.g., BPAY) and telegraphic/wire transfers • Investment purchase or sale • Loan applications and transactions • Management of multiple users having varying levels of authority • Set-up/cancel direct debits/standing orders • Change personal details • Upgrade/downgrade account • Foreign exchange currency • Online help • Online (personalised) offers **NOT** an advantage <u>must be a service</u> *Any reasonable answer*	1 1 1	3

7b	Award 1 mark per point. Any **three** of:		
	• Available 24/7 **NOT** just 24/7	1	
	• Higher interest rates for savings accounts / Lower interest rate loans etc.	1	
	• Save travel time going to bank / saves queuing time in a bank/ faster access to services	1	
	• Save travel costs		
	• Increased market awareness - visit all the banks and find out what interest rates they offer online.		
	• Empowers the disabled		
	• Faster to set up online account transfers		
	• Global access/ banking on the go		
	NOT 'can do it from home'/'can do it from the comfort of your own home'/ 'saves you having you to go to the bank'/'no queues'		
	NOT services		3
7c	Award 1 mark per point. Any **two** of:		
	• Cyber-attack can cause loss of data	1	
	• Failure of systems can result in downtime and loss of trade	1	
	• Reputation can be damaged by system error/security failure		
	• Cannot cross-sell as customers are not at branch		
	• Huge setup costs to buy equipment / infrastructure/security		
	MUST be disadvantages <u>to the bank</u>		
	Hacking **MUST** be qualified e.g. hacking can cause loss of data/damage reputation		
	NOT identity theft		2
8a	Award 1 mark per point.		
	Advantages		
	• No expenses for travelling to work	1	
	• No time wasted commuting		
	• Employees do not have to relocate for their work / can live anywhere		
	• Convenient for people with a disability		
	• No need for long journeys / traffic / stressful commutes		
	• Work can fit around family commitments		
	• Employees can choose their own hours		
	Disadvantages		
	• Employee may feel isolated both living and working at home	1	
	• The boundary between both home and work is lost/work life balance		
	• More competition for jobs / Wider geographic range of applicants		
	• Other people living in the house may disturb the employee		
	• Office space required at home		
	• No colleagues to socialise with		
	• Utility bills increase for heating, etc.		
	• Employees may have to pay for and maintain their own equipment		
			2

8b	Award 1 mark per point. Advantages • Fewer backup staff needed e.g. Cleaners • Staff less likely to spend time off work sick • Less office furniture needed • Less office space needed • Reduced office overheads (gas, electricity, office premises) • Staff may be more productive if they can chose their own hours / work from the comfort of their own home • Employers are not restricted to a local workforce Disadvantages • Hard to monitor how hard staff are working • Harder for managers to manage the work • Increased number of sites for the network may create a security risk • Employers may have to pay for and maintain their employees equipment • Harder to conduct meetings • Change to organisational structure may be needed. **NOT** harder to communicate	1 1	2
9a	Award 1 mark per point. Any **one** of: • Computer systems performing tasks normally requiring human intelligence • Learning computers • Computer that thinks like a person **NOT** computer that carries out human tasks (must be different from robot)	1	1
9b	Award 1 mark per point. Any **two** of: • Game playing • Speech recognition • Natural language • Computer vision • Expert systems • Neural networks • Financial systems • Online and customers services • Pattern recognition • Robotics • Auto pilot • Autonomous vehicle Two marks may be awarded for specific uses within the areas above e.g. expert systems - medical diagnosis (1), car faults diagnosis (1)	1 1	2

9c	Award 1 mark per point. Any **one** of: • Increase in technological growth rate - AI potentially help us 'open doors' into new and more advanced technological breakthroughs. • Volume of data analysis • Speed of data analysis • Deductive logic by pattern matching • Almost limitless function / continuous improvement • They will make fewer mistakes • They don't forget	1	1
10a	Award 1 mark per point. **Sensor:** Temperature / heat sensor **Output devices:** • Heater / radiator • Fan / AC unit	1 1 1	3
10b	Award 1 mark per point. **A:** Is the temperature above 24°C? **B:** Turn on the <u>cooling</u> device **C:** Is the temperature below 18°C? **D:** Turn on the <u>heating</u> device A and B are interchangeable with C and D **MUST** have cooling and heating aspects to be awarded full marks.	1 1 1 1	4
11	Award 1 mark per point. Any three of: • GPS – reduces fuel consumption by planning the shortest/fastest route • Teleworking – avoids the need to travel reducing emissions. • Online shopping has increased the number of delivery lorries on the road, causing increased congestion and increases in carbon emissions. • ICT has led to a paperless society • ICT equipment generates heat so many organisations install air conditioning systems leading to increased carbon emissions. • Many computer are left on standby, wasting electricity unnecessarily and increasing carbon emissions. *Any reasonable answers*	1 1 1	3
12	**Indicative content** Advantages of using networks over standalone computers: • Share hardware • Share resources (if qualified, e.g. share printers / scanners) • Share software • Share data / files • Access own data from any workstation • <u>Central backup</u> / shared memory • Easier to monitor network activity • Centrally controlled security • Central administration tools	12	12

Different types of network topology:
- Star
- Bus / line
- Ring (Not 'circle')
- Accept other network types (e.g. mesh, cell)

Network devices:
- **Bridge (for linking network between two buildings)**
    - Joins together two networks that use the same base protocols,
    - Links similar types of networks
    - Links LAN to LAN
- **Gateway (for linking network to supplier network / internet)**
    - Joins together two networks that use different base protocols
    - Links different types of networks
    - Links LAN to WAN
    - Allows a LAN to connect to the internet
- **Switch**
  A switch looks at each packet of data and then sends it to the computer it was intended for / routes data /directs data between computers on the network.
- **Router**
    - Device which stores the addresses of computers on the network.
    - Transfer data between devices

Criteria Marked

Band	Max 12 marks
3	**9-12 marks** The candidate has: • shown clear understanding of the requirements of the question and a clear knowledge of the indicative content. Clear knowledge is defined as a response that provides nine to twelve relevant detailed points, which relate to an extensive amount of the indicative content • addressed the question appropriately with minimal repetition and no irrelevant material • used appropriate terminology and accurate spelling, punctuation and grammar.
2	**5-8 marks** The candidate has: • shown adequate understanding of the requirements of the question and a satisfactory knowledge of the indicative content. Satisfactory knowledge is defined as a response that provides five to eight points as signalled in the indicative content. • Given a response where there are a few errors in spelling, punctuation and grammar.
1	**1-4 marks** The candidate has: • attempted to address the question but has demonstrated superficial knowledge of the content specified in the indicative content. Superficial knowledge is defined as a response that provides one to four points on the indicative content • given a response that lacks clarity and there are significant errors in spelling, punctuation and grammar.
0	**0 marks** • Response not credit worthy or not attempted.

| | **Total** | **80** |

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