GCSE MARKING SCHEME

COMPUTER SCIENCE

SUMMER 2014

INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2014 examination in GCSE COMPUTER SCIENCE. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were 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 conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

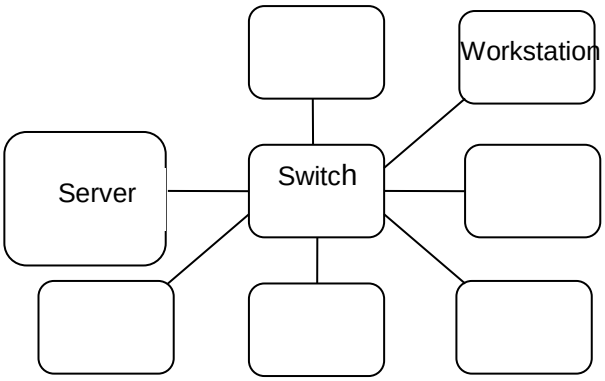
It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

UNIT 1

<table>
<tr><th>Q.</th><th>Answer</th><th>Marks</th><th>MAX</th></tr>
<tr><td>1.</td><td>One mark for each of:
1 External hard disc drive
3 DVD
6 Solid state hard drive
7 USB flash memory stick

Deduct one mark for each additional tick above 4</td><td>
1 mark
1 mark
1 mark
1 mark</td><td>4</td></tr>
<tr><td>2.</td><td><table><tr><th></th><th>Input</th><th>Output</th><th>Input and output</th><th>Not used for input or output</th></tr><tr><td>Microphone</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>Volume button</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>Touch screen</td><td></td><td></td><td>✓</td><td></td></tr><tr><td>Speaker</td><td></td><td>✓</td><td></td><td></td></tr><tr><td>Memory card</td><td></td><td></td><td></td><td>✓</td></tr><tr><td>Camera</td><td>✓</td><td></td><td></td><td></td></tr></table>Two ticks in one row then no mark.</td><td>1 mark
1 mark
1 mark
1 mark
1 mark
1 mark</td><td>6</td></tr>
<tr><td>3.(a)</td><td>A computer uses RAM to store programs (and data)
while they are being executed - condone being run / processed</td><td>1 mark
1 mark</td><td>2</td></tr>
<tr><td>3. (b)</td><td>A computer with 8 gigabytes of RAM could run several large programs faster than a computer with 2 gigabytes of RAM because:
all the programs might fit in RAM
and not have to be read in and out to/from disc</td><td>
1 mark
1 mark</td><td>2</td></tr>
<tr><td>3. (c)</td><td>It has two processors / carry out two instructions at the same time
It means the computer could run programs faster</td><td>1 mark
1 mark</td><td>2</td></tr>
<tr><td>3. (d)</td><td>This is the clock speed of the processor
5GHz means (5 billion or 5 000 000 000) cycles per second</td><td>1 mark
1 mark</td><td>2</td></tr>
</table>

Q.	Answer	Marks	MAX
4. (a)	***Star:*** *1 mark for correct topology* *1 mark for switch/hub/router* *1 mark for server or workstation labelled correctly*  	3 marks	3
4. (b)	***Advantages of star topology compared to bus:*** If one cable/connection breaks (NOT computer) network can still operate Can be easier to detect faults (as can ping each station directly) Data has to pass through switch so more secure Easier to extend star / add new stations Different devices can transmit at different speeds Less data collisions (condone no collisions) ***Disadvantages of star topology compared to bus:*** If central hub or switch fails that WHOLE network (or sub-network) cannot operate Uses more cable as each station needs to be connected to switch More difficult / expensive **to set up** (cost of switch can be quite expensive (Bus networks are cheap to set up) More difficult (complex) / expensive **to maintain** (network manager)	2 marks 2 marks	4
5. (a)	Role of a virus checker is to detect viruses Functions of a virus checker include: • Checking all outgoing and incoming emails and attachments • Checking all files downloaded • Scan hard drive • Warns user of any suspicious files / provide option to delete or quarantine viruses • Maintain an up to date database of all know viruses • Heuristic scanning methods that identify unclassified viruses based on virus-like behaviour	1 mark 3 marks	4

Q.	Answer	Marks	MAX
5. (b)	Role of a firewall is to stop unauthorised access to a computer (system) via a network (internet) Functions of a firewall include: • Filter certain data packets • Block certain ports • Follows a set of pre-set rules • Block access to specified web sites • Block programs on computer accessing the internet • Block certain downloads / ask for confirmation when downloading a file • Enforce additional authentication from outside • Prevent users on network accessing specified data/files • Limit outside access to specified parts of system like the web server	1 mark 3 marks	4
6.	the number of bedrooms - integer the postcode of the property - string if the property is still for sale TRUE or FALSE - Boolean the council tax band which can be A, B, C, D, E, F or G – Char/Character	1 mark 1 mark 1 mark 1 mark	4
7.	The role of a Domain Name System (DNS) server is to **translate** meaningful names (e.g. wjec.co.uk) into IP addresses. Domain Name System (DNS) server has a **list of domains** and corresponding IP addresses. Checks 'your' domain server and if it does **not** hold the IP address Then it can query other domain name servers (hierarchical) for addresses. (Or is updated by other servers) Accept (not expected) but maximum four marks When you want to access a domain your 'local' domain server is queried and the IP address found.	1 mark 1 mark 1 mark 1 mark	4
8.	**One mark for each description, development or example up to a maximum of five:** • Provides meaningful icons / menus • Allows creation of shortcuts • Allows copying / deleting / moving / sorting / searching of files or folders • Allows easy navigation of folders • Allows customisation of desktop such as change colours and layout • Allows user to have more than one window open • Allows user to switch / copy between windows • Provides user with error/warning/help messages • Allows intuitive interaction with interface Each point can be extended, possibly with examples to gain extra mark	5 marks	5

<table>
<tr><th>Q.</th><th>Answer</th><th>Marks</th><th>MAX</th></tr>
<tr><td>9.(a)</td><td>photographs are compressed to make the file (not the photograph) smaller</td><td>1 mark</td><td>1</td></tr>
<tr><td>9.(b)</td><td>Two advantages for the social networking web site of using compressed photographs – and two of:
• saves space on their servers
• quicker to upload to server (improved customer experience
• web site pages will download quicker (be quicker to view)</td><td>2 marks</td><td>2</td></tr>
<tr><td>9.(c)</td><td>lossless compression algorithm is the most suitable for a professional photographer as photographs do not lose quality (loss will be noticeable when printed)</td><td>1 mark</td><td>1</td></tr>
<tr><td>10.(a)</td><td>A syntax error is mistake in the rules (grammar) of the language

For example:
IF without THEN
missing punctuation
key or reserved word spelt incorrectly

NOTE: example can come from a specific language but it must be clear that it is a syntax error by showing what the correct word should be for example pring should be print, msgbos should be msgbox

If just ‘spelling mistake’ then must have example like above</td><td>1 mark

1 mark</td><td>2</td></tr>
<tr><td>10.(b)</td><td>A run time error is stops the execution of the code and are caused by:

For example:
division by zero
reading past the end of file
stack overflow / request more memory than available
overflow of data type (for example, integer too big)
trying to access out of range array</td><td>1 mark

1 mark</td><td>2</td></tr>
<tr><td>10.(c)</td><td>A logical error is a mistake in the program – telling it to do the wrong thing

For example:
branch to the wrong statement
call the wrong sub-routine
A = B + C instead of A = B – C, GrossPrice = NetPrice - VAT
looping too many times</td><td>1 mark

1 mark</td><td>2</td></tr>
<tr><td>11.(a)</td><td>One mark for each of:

<table><tr><td>8</td><td>bits</td><td>=</td><td>1</td><td>byte</td></tr><tr><td>1024</td><td>bytes</td><td>=</td><td>1</td><td>kilobyte</td></tr><tr><td>1024</td><td>kilobytes</td><td>=</td><td>1</td><td>megabyte</td></tr></table></td><td>1 mark
1 mark
1 mark</td><td>3</td></tr>
</table>

<table>
<tr><th>Q.</th><th>Answer</th><th>Marks</th><th>MAX</th></tr>
<tr><td>11.(b)</td><td>One mark for each correct answer:
<table><tr><th>A</th><th>B</th><th>A or B</th></tr><tr><td>T</td><td>T</td><td>True or T</td></tr><tr><td>T</td><td>F</td><td>True or T</td></tr><tr><td>F</td><td>T</td><td>True or T</td></tr><tr><td>F</td><td>F</td><td>False or F</td></tr></table></td><td>1 mark
1 mark
1 mark
1 mark</td><td>4</td></tr>
<tr><td>12.</td><td>One advantage of using Unicode instead of ASCII is that you can store many more characters (such as other languages like Chinese)
One disadvantage of using Unicode instead of ASCII is that it uses more memory to store each character</td><td>1 mark

1 mark</td><td>2</td></tr>
<tr><td>13</td><td>Begins with
Before the loop
and ends with
Loop has ended

Count is 1
Count is 2
Count is 3

Deduct one mark for any additional output
Condone quotation marks</td><td>1 mark

1 mark</td><td>2</td></tr>
<tr><td>14. (a)</td><td>3 = 0011
C = 1100</td><td>1 mark
1 mark</td><td>2</td></tr>
<tr><td>14.(b)</td><td>3C = 0011 1100 (binary to denary)
<table><tr><td>128</td><td>64</td><td>32</td><td>16</td><td>8</td><td>4</td><td>2</td><td>1</td><td></td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td></td></tr><tr><td>0</td><td>0</td><td>32+</td><td>16+</td><td>8+</td><td>4</td><td>0</td><td>0</td><td>= 60</td></tr></table>Alternatively hex to denary directly
<table><tr><td>256</td><td>16</td><td>1</td><td></td></tr><tr><td>0</td><td>3</td><td>C</td><td></td></tr><tr><td>0</td><td>3 x 16 = 48</td><td>1 x 10 = 12</td><td></td></tr><tr><td>0</td><td>48 +</td><td>12</td><td>= 60</td></tr></table>Correct workings (If correct then condone no workings as workings implied)
Correct answer</td><td>

1 mark
1 mark</td><td>2</td></tr>
<tr><td>14.(c)</td><td>1111 → 15 → F
0111 → 7 → 7
11110111 = F7</td><td>1 mark

1 mark</td><td>2</td></tr>
<tr><td>14.(d)</td><td>Hex numbers are used:
as a shorthand (encoded) form of binary
because they are easier to read/write than binary
you are less likely to make a mistake

as Hex numbers contain few digits and letters compared to a large number of 1’s and 0’s</td><td>1 mark

1 mark</td><td>2</td></tr>
<tr><td>15.</td><td>HTTP - transferring (multimedia) web pages over the Internet
FTP - copying a file from one location to another via the Internet or over a network / uploading a file
SMTP - sending emails between computer systems</td><td>1 mark

1 mark
1 mark</td><td>3</td></tr>
</table>

Q.	Answer		Marks	MAX
16.	**9 – 12 marks**	Detailed discussion of all current legislation. There will be few, if any, errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.		12
	5 – 8 marks	Some discussion of current legislation. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.		
	1 – 4 marks	Superficial coverage – could be a list. Information will be poorly expressed and there will be limited, if any, use of technical terms. There are significant errors in grammar, punctuation and spelling.		
	0 marks	No appropriate content.		
	Indicative content **Examples of points which may be discussed or expanded through use of suitable examples.** **The Data Protection Act** • Every data controller who is processing personal information must register with the Information Commissioner's Office (ICO) • Data is fairly and lawfully processed • Held securely • Personal data stored for no longer than necessary • Personal data shall be adequate, relevant and not excessive • Data must be accurate and up to date • Data can only be transferred outside EC to countries with adequate DP legislation • Processed in line with your rights • Data is processed for limited purposes **Computer Misuse Act** • Unauthorised access to computer material • Unauthorised access to computer material with intent to commit further offences • Unauthorised modification of computer material **Copyright, Designs and Patents Act 1988** Copyright infringement that may be criminal offences under the Copyright Act: • Making copies for the purpose of selling or hiring them to others • Importing infringing copies (except for personal use) • Offering for sale or hire, publicly displaying or otherwise distributing infringing copies in the course of a business • Distributing a large enough number of copies to have a noticeable effect on the business of the copyright owner • Making or possessing equipment for the purposes of making infringing copies in the course of a business • Communicating copies or infringing the right to "make available" copies to the public			
		Total marks		**90**

UNIT 2

Task 1	Answer	MAX 6
	One mark for each correct <u>pair</u> of tags in the correct location: i.e. ** ** ** ** ** ** ** (Note http:// is required or the link will not work correctly on many devices)** **Accept either or (No need to close p)** **Accept alternative tags e.g. <big></big> instead of , etc** **Accept alternative solutions which work. (Only if the identical formatting would be achieved.)** <html><body> Wanted! Your old mobile phone for cash! Click to visit www.phonerecycle.co.uk ***(Note: One mark for a href*** ***One mark for http://)*** Here at PhoneRecycle we can pay you for your old working mobile phones. We recycle the components and refurbish handsets ready for their next use. Please visit our website for a quote <u>today!</u> </body></html> **Note: Condone missing <html> and <body> tags.**	1(centre) 1(h1) 1(p b i) 1 1 1 (u b)

Task 2	Answer	MAX 9
	Declare JudgeMark=0 Declare maxMark =0 Declare minMark=6 Declare total=0 Declare FinalMark=0 1 Repeat **(for i = 1 to 6)** 2 input JudgeMark 3 if JudgeMark>maxMark 4 then maxMark=JudgeMark 5 endif 6 if JudgeMark<minMark 7 then minMark=JudgeMark 8 endif 9 total=total+JudgeMark 10 Until 6 loops **(end for)** 11 total=total-minMark 12 total=total-maxMark 13 FinalMark = total/4 14 output “Highest:” 15 output maxMark 16 output “lowest Mark:” 17 output minMark 18 output “Final Mark” 19 output FinalMark **Line numbers not necessary Ignore indentation or lack of it.** **Accept alternative solutions as long as they provide the exact same result.** **Condone no variable declaration**	**(awarded at line 10)** **1 (input)** **1 (IF mark or award for line 6)** **1 adding total** **1 (loop mark)** **1 (discard lowest)** **1 (discard highest)** **1 (divide logic)** **1 (output text – award for any valid output)** **1 (output –any valid variable)**

Task 3	Answer		MAX 15
	11-15 Marks	The candidate has produced a complete working solution to the task. The program is written efficiently and has been compiled. Crabs turn left, right, up and down on key press and a sound is played when a wombat is eaten. A crab eats the wombat when they collide, adding to the counter. The program has been written coherently, technical terms have been used correctly, the meaning is clear and there are no errors in spelling and punctuation. Only award 15 if all tasks completed correctly (including naming of files correctly and all tasks implemented fully)	
	6-10 Marks	The candidate has produced a working solution. The program has been compiled but one or more of the elements is missing or incomplete. Technical terms have been used correctly, the meaning is clear and there are few errors in spelling and punctuation. Trivial syntax errors that prevent compilation of an otherwise functional solution should not be penalised.	
	1-5 Marks	The candidate has produced a partial solution to the task but there is some evidence of functionality. Technical terms, where used, are correct, but there are significant errors in spelling and punctuation. Only award 5 if the file is saved as FinalWJECCrabs	
	0 Marks	No valid response	
		Total Marks for Paper:	**30 Marks**

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