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# **GCSE MARKING SCHEME**

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**SUMMER 2022**

**COMPUTER SCIENCE - UNIT 2  
3500U20-1**

## **INTRODUCTION**

This marking scheme was used by WJEC for the 2022 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.

**GCSE COMPUTER SCIENCE**  
**UNIT 2 - COMPUTATIONAL THINKING AND PROGRAMMING**  
**SUMMER 2022 MARK SCHEME**

**Guidance for examiners**

Positive marking

It should be remembered that learners are writing under examination conditions and credit should be given for what the learner writes, rather than adopting the approach of penalising him/her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

For questions that are objective or points-based the mark scheme should be applied precisely. Marks should be awarded as indicated and no further subdivision made.

For band marked questions mark schemes are in two parts.

Part 1 is advice on the indicative content that suggests the range of computer science concepts, theory, issues and arguments which may be included in the learner's answers. These can be used to assess the quality of the learner's response.

Part 2 is an assessment grid advising bands and associated marks that should be given to responses which demonstrate the qualities needed in AO1, AO2 and AO3. Where a response is not credit worthy or not attempted it is indicated on the grid as mark band zero.

## **Banded mark schemes**

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks.

Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. Once the annotation is complete, the mark scheme can be applied.

This is done as a two-stage process.

### **Stage 1 – Deciding on the band**

When deciding on a band, the answer should be viewed holistically. Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance, if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content. Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

### **Stage 2 – Deciding on the mark**

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is also provided for banded mark schemes. Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

Q	Answer	Mark	AO1	AO2	AO3	Total
1.	<p><b>Award 1 mark for each correct <u>pair</u> in the correct location:</b>  <b>i.e.</b>  <b>&lt;h1&gt; &lt;/h1&gt;</b>  <b>Accept either &lt;p&gt; or &lt;p&gt; &lt;/p&gt; (No need to close p)</b></p> <p><b>&lt;a href="url"&gt; &lt;/a&gt; (Note http:// is required or the link will not work correctly on many devices)</b></p> <p><b>Accept alternative tags e.g. &lt;big&gt;&lt;/big&gt; instead of &lt;h1&gt;&lt;/h1&gt;, etc</b></p> <p><b>&lt;ul&gt; and &lt;li&gt; count as a single item as both must be used together</b></p> <p><b>Accept alternative HTML (not CSS) solutions which work (only if the identical formatting would be achieved).</b></p> <pre> &lt;html&gt; &lt;head&gt; &lt;title&gt; RobotCleaning &lt;/title&gt; &lt;/head&gt; &lt;body&gt; &lt;h1&gt;RobotCleaning &lt;/h1&gt; &lt;img src="robot.jpg"&gt; &lt;p&gt; Researching robotics? &lt;/p&gt; &lt;p&gt; &lt;ul&gt; &lt;li&gt; Robot vacuum cleaner&lt;/li&gt; &lt;li&gt; Robot mop&lt;/li&gt; &lt;li&gt; Robot lawn mower&lt;/li&gt; &lt;/ul&gt; &lt;/p&gt; &lt;p&gt; Click the link below to find out more: &lt;/p&gt; &lt;p&gt; &lt;a href="http://www.RobotCleaning.Wjec.co.uk"&gt; www.RobotCleaning.Wjec.co.uk &lt;/a&gt;&lt;/p&gt; &lt;/body&gt; &lt;/html&gt; </pre>	<p>1(html)  1(head)  1(title)</p> <p>1(body)</p> <p>1 (h1)</p> <p>1(img)</p> <p>1(ul and lix3 )</p> <p>1&lt;p&gt; anywhere</p> <p>1 (a href=  1 ("http://)</p>		2b		10

Q	Answer	Mark	AO1	AO2	AO3	Total
2.(a)	<b>Award 1 mark</b> for each of:		1a			8
(i)	OUT					
(ii)	LDA					
(iii)	STA					
(iv)	ADD					
(b)	<p><b>Indicative content:</b></p> <p>INP STA 99 INP ADD 99 OUT HLT</p> <p><b>Must use Mnemonics from spec.</b></p> <p><b>These in correct order others in between acceptable as above:</b></p> <p>INP ADD OUT HLT</p>					
		1		2b		
		1		2b		
		1		2b		
		1		2b		

Q	Answer	Mark	AO1	AO2	AO3	Total																					
3.	<p><b>Award 1 mark for each correct input(s) and 1 mark for each correct output (not needed in this order):</b></p> <table border="1"> <thead> <tr> <th>A</th> <th>B</th> <th>A AND B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>A</th> <th>NOT A</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> </tr> </tbody> </table> <p>Accept TRUE / FALSE in place of 1 / 0</p>	A	B	A AND B	0	0	0	0	1	0	1	0	0	1	1	1	A	NOT A	0	1	1	0	2  2	1b			4
A	B	A AND B																									
0	0	0																									
0	1	0																									
1	0	0																									
1	1	1																									
A	NOT A																										
0	1																										
1	0																										
4. (a)	<p><b>Award 1 mark</b> for each correct output order is important but ignore missing outputs (i.e. missing/ incorrect middle outputs may be followed by correct final output) ignore punctuation and indentation.</p> <p>About to add 0 1 2 The total is 3</p>	1 1 1 1 1		2b		5																					
(b)	<b>Accept either half of /</b>			2b		4																					
(i)	Total	1																									
(ii)	Counter	1																									
(iii)	set total = 0 / set counter = 0	1																									
(iv)	do / while counter < 2	1																									

Q	Answer	Mark	AO1	AO2	AO3	Total
(c)	<p><b>Brackets+Bold text indicate other accepted Pseudocode.</b></p> <p><b>Accept i,j,k for loops; accept any other meaningful variable name.</b></p> <p><b>Amendments to check for zero entered or divide by zero error (and any further validation) accepted not expected.</b></p> <p><b>Line numbers not necessary. Ignore indentation or lack of it.</b></p> <p><b>Accept alternative solutions as long as they provide exactly the same result.</b></p> <p>Example:</p> <pre> currentNumber is integer maxNo is integer minNo is integer total is integer mean is real  set currentNumber=0 set maxNo =0 set minNo=999 <b>(or any big number &gt; 10)</b> set total = 0 set mean =0  for i = 1 to 3                <b>(Do)</b>  output "Enter a reading:" input currentNumber      if currentNumber &gt;maxNo then         maxNo= currentNumber     endif      if currentNumber &lt;minNo then         minNo= currentNumber     endif      total=total+ currentNumber endif  next i <b>(loop until ...)</b>  mean=total/3  output "Total:"&amp; total output "Mean:" &amp; mean output "Largest:" &amp; maxNo output "Smallest:" &amp; minNo  End Subroutine </pre>				3b	7



Q	Answer	Mark	AO1	AO2	AO3	Total
	<p><b><u>Award 1 mark for each of:</u></b></p> <ul style="list-style-type: none"> <li>• Output Text (String literal similar to example)</li> <li>• Input value into a variable (must be obvious variable)</li> <li>• Selection (comparison using if for smallest or largest)</li> <li>• Correctly adding (total=total+ currentNumber)</li> <li>• Output a valid variable</li> <li>• The solution provides at least one correct numerical output</li> <li>• The solution provides <b>all</b> correct numerical outputs</li> </ul> <p><b>Alternatively, a flowchart matching above award full credit.</b></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>				
5.	<p><b>Award 1 mark per point below:</b></p> <p>(a) New world class in Greenfoot environment with correct image. (accept grid of more than 9*9)</p> <p>(b) Class called Leaf / Leaves (anything suitable) exist (on right) and has image of leaf (given or built in).</p> <p>(c) World is populated with six leaves on open.</p> <p>(d) Leaf moves when on/added to world randomly.</p> <p>(e) Greenfoot world saved correctly as any suitable name (e.g. finalLeaves, Q5, Screensaver etc) (ignore capital letters)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>			3b	5
6.	<p><b>Award 1 mark for each:</b></p> <p>(a) World Or Actor (condone incorrect capitalization)</p> <p>(b) Ground (condone incorrect capitalization)</p> <p>(c) counter (lower case only) OR totalCount (condone incorrect capitalization)</p>	<p>1</p> <p>1</p> <p>1</p>		2b		5

Q	Answer	Mark	AO1	AO2	AO3	Total
(d)	public void act() (Accept no public, void, brackets - act sufficient) OR bumpCount Or any of the class constructors (class names)	1				
(e)	amount OR Int amount	1				
7.	<b>Award 1 mark per <u>bulleted</u> point below:</b>				3b	12
(a)	World is pre-populated on load with: <ul style="list-style-type: none"> <li>• one tree only</li> <li>• two or more water drops</li> <li>• one sun.</li> </ul>	1 1 1				
(b)	• water <b>and</b> sun move “randomly” around world.	1				
(c)	• tree moves around world according to arrow keys. • tree moves with appropriate relative speed to other objects	1 1				
(d)	• water is removed from world on collision with tree.	1				
(e)	• sound plays when tree and water collide	1				
(f)	• counter added to world. • counter increments when tree and water collide.	1 1				
(g)	• counter decrements when water and sun collide.	1				
(h)	• Greenfoot world saved correctly as FinalWJECTrees7 (ignore capitalization Ignore WJEC)	1				