GCSE MARKING SCHEME

SUMMER 2018

COMPUTER SCIENCE - COMPONENT 2
C500U20-1

INTRODUCTION

This marking scheme was used by WJEC for the 2018 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.

EDUQAS GCSE COMPUTER SCIENCE

COMPONENT 2 – C500U20-1

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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. (a)	<html>	1	a			3
(b)	 (Condone)	1	a			
(c)	<hr>	1	a			

2.	**1 mark for each correct <u>pair</u> in the correct location: i.e.**
	** **
	** **
	** **
	Accept either or (No need to close p)
	
	** (Note http:// is required or the link will not work correctly on many devices)**
	
	Accept alternative tags e.g. <big></big> instead of , etc
	
	Accept alternative HTML (not CSS) solutions which work (only if the identical formatting would be achieved).
	
	`<html>`
	`<head>`
	`<title>`
	`Cybersecurity Briefing`
	`</title>`
	`</head>`
	`<body>`
	
	`<center>`
	`<h1>Cybersecurity briefing</h1>`
	`<p><b>Staying up to date with current issues. </b></p>`
	
	`<img src="firewall.jpg">`
	`</center>`
	
	`<p>Hear speakers on a range of topics including:`
	
	`<ul>`
	`<li>Cyber essentials</li>`
	`<li>Risk discovery</li>`
	`<li>A day in the life of a hacker</li>`
	`</ul>`
	`</p>`
	
	`<p>`
		Award:
		
		1 head
		1 title
		
		1 body
		
		1(center)
		1 (h1)
		
		1 (need b)
		1 (img src …)
		
		1 (need ul and li)
				a		10

Q	Answer	Mark	AO1	AO2	AO3	Total
	All of the above in a modern open and fascinating insight into the evolving landscape of cyber security! Click the link below to find out more: www.cybersecuritybriefing.co.uk </body> </html>	1 (a href) 1 (http://)				
3.(a)(i)	LDA	1	a			3
(ii)	BRA	1	a			
(iii)	HLT (condone lower case answers)	1	a			
3.(b)	It is good practice to use self-documenting identifiers in code whenever possible as: **Award a mark** for any two from below up to a maximum of two: **Ease of use**: Make source code easier to read and understand **Maintainability**: in future the code will be easy to maintain changes can be made as we know what variables/methods to make changes to. **Maintenance**: It is easier to debug errors if it is clear what each identifier is/contains. (and possibly improve reusability) **Documentation**: Reduces the need for extra documentation or to refer to documentation whilst writing code. (Accept can generate documentation from code)	1 mark x 2	b			2

Q	Answer	Mark	AO1	AO2	AO3	Total
4.	**Award one mark** for each correct line below: Beginning a loop Counter is: 1 Multi is: 1 Counter is: 2 Multi is: 2 Counter is: 3 Multi is: 6 Loop completed String literals must be exact and correct to gain the mark Condone: Award maximum of 7 marks if colons are missing from string literals. Condone: Speech marks at the beginning and end of each line	 1 1 1 1 1 1 1 1		b		8
5.	1 overLargeScreen is integer 2 requiredSize is integer 3 currentScreenSize is integer 4 numberToTest is integer 5 count is integer 6 set count = 0 7 set numberToTest = 0 8 set overLargeScreen = 0 9 set requiredSize = 101 10 set currentScreenSize = 0 **11 output "Please enter the number of screens to test:"** 12 input numberToTest 13 for count = 1 to numberToTest 14 output "Please enter the size of screen:" & count 15 input currentScreenSize **16 if currentScreenSize > requiredSize then** 17 output "Discard this screen as it is too large." 18 overLargeScreen = overLargeScreen +1 19 end if **20 next count** 21 output "The total number of discarded screens:" & overLargeScreen **22 End Subroutine**	**Award 1 mark** for each correctly placed line below in bold. 1 1 1 1		b		4

Q	Answer	Mark	AO1	AO2	AO3	Total

6.	**Brackets+Bold text indicate other accepted Pseudocode.**
	
	Accept i,j,k for loops; accept any other meaningful variable name.
	
	Amendments to check for zero entered or divide by zero error (and any further validation) accepted not expected.
	
	Line numbers not necessary. Ignore indentation or lack of it.
	
	Accept alternative solutions as long as they provide exactly the same result.
	
	Indicative content
	
	currentNumber is integer
	maxNo is integer
	minNo is integer
	howMany is integer
	total is integer
	mean is real
	
	set currentNumber=0
	set maxNo =0
	set minNo=65535 **(or any number > 65535)**
	set howMany=0
	set total = 0
	set mean =0
	
	repeat **(Do)**
	
	output “Enter a number:”
	input currentNumber
	if currentNumber < 65536 then
	
	  if currentNumber >maxNo then
	  maxNo= currentNumber
	  endif
	
	  if currentNumber <minNo then
	  minNo= currentNumber
	  endif
	
	  howMany=howMany+1
	
	  total=total+ currentNumber
	endif
	
	until currentNumber > 65535 **(loop until)**
					b	9

Q	Answer	Mark	AO1	AO2	AO3	Total
	mean=total/ howMany output “Total:”& total output “Mean:” & mean output “Largest:” & maxNo output “Smallest:” & minNo End **<u>Award 1 mark for each bullet below:</u>** **<u>N.B. must be related to the problem</u>** • Declare and initialise variables • Input value into variable • Repeat (concept of loop which ends on a rogue value) • Selection (comparison using if) • Keeping track of numbers (i.e. howMany, maxNo, minNo, total) • Correctly calculating mean (mean=total/ howMany) • Output a variable • Check for rogue value not included in total • The solution provides all correct numerical outputs	1 1 1 1 1 1 1 1 1				

Q	Answer	Mark	AO1	AO2	AO3	Total

7.	Identify the two main shortcomings:
	Award one mark for any two of below:
	`if username = "User1" OR password =` (should not be `OR`)
	`DO Loop` (should not be endless loop)
	(Accepted not expected):
	`if username = "User1" OR password = "Pass1"`
	
	Explain the two main shortcomings:
	Award one mark for any two of below:
	
	• Username or password being correct logs in the user into the program/No need to know a correct password.
	• Endless loop even if the correct username and password is entered/User can have as many guesses as they want.
	
	(Accepted not expected):
	• Hard coding of username and password credentials is bad practice.
	
	Rectifying the two main shortcomings:
	Award one mark for any two of below:
	Correct the OR statement to an AND statement
	e.g.
	`if username = "User1" AND password =`
	
	Add a terminating condition to the Do Loop
	e.g.
	`do loop until counter = 3`
	`do loop until loggedIn = TRUE`
	
	(Accepted not expected):
	Remove hard coded username and password
	e.g.
	`if username = DBlookupUN OR hash(password) = pwdHash`
	
	Candidates are likely to combine Identify explain and rectify into two paragraphs (one for each problem) this may be awarded full credit.
		Max 6
		
		1
		
		1
		
		1
		
		1
		
		1
		
		1
				b		6

Q	Answer	Mark	AO1	AO2	AO3	Total
8.	1 mark per bullet point below:				b	15
(a)	World is pre-populated on load with: • one umbrella only • two or more water drops • one sun.	 1 1 1				
(b)	• water drops move around world. • sun moves waround world. • random movement implemented using a function (such as `getRandomNumber`)	1 1 1				
(c)	• umbrella moves around world according to arrow keys. • umbrella moves with appropriate relative speed to water drops (equal to or greater than the speed of the drops)	1 1				
(d)	• water drop is removed from world on collision with umbrella.	1				
(e)	• sound plays when umbrella and water drop collide	1				
(f)	• counter added to world. • counter increments when umbrella and water drop collide.	1 1				
(g)	• counter decrements when water drop and sun collide. • implementation via parameter passing as opposed to wholly new method.	1 1				
(h)	• Greenfoot world saved correctly as finalDrop8	1				