GCE AS MARKING SCHEME

SUMMER 2022

AS (NEW)
COMPUTER SCIENCE - UNIT 2
2500U20-1

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.

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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.
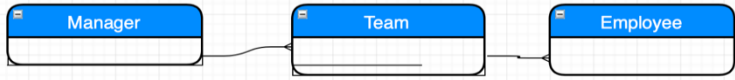
Stage 2 – Deciding on the mark

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.

Section A

Q	Answer	Mark	AO1	AO2	AO3	Total
1. (a)	**Award 1 mark** for each:			2.1b		5
	• Identification of Manager table is relevant	1				
	• Identification of Team table is relevant	1				
	• Identification of Employee table is relevant	1				
	• Correct relationship link from Manager to Team (1:M)	1				
	• Correct relationship link from Team to Employee (1:M) (must indicate many side for each mark above)	1				
(b)	**Any table from part 1a above:**			2.1b		10
	• Fieldnames (2 suitable fields in addition to KF)	1+1				
	• Data types (accept autonumber as type)	1+1				
	• Key Field (any indicator of KF if clear (*/underline))	1				
	• Field lengths (accept single/double)	1+1				
	• Requirements for Validation (one mark for each type) ○ Range, Format, Presence, Length ...	3				
	Indicative content					
	Non-exhaustive example of Manager table:					

Fieldname	Keyfield	Data Type	Field Length	Validation
ManagerID	Yes-indexed	Integer	10	Presence
Title	-	String	10	Lookup Mr, Mrs, Miss …
FirstName	-	String	25	
…	…	…	…	…
Postcode	-	String	9	Format LL00 0LL
Salary	-	Real	40	>0

Etc.

Q	Answer	Mark	AO1	AO2	AO3	Total
2.	**Indicative content:** • Discussion of interface (CLI/GUI) • Data Structures (arrays/files) • File handling (serial/random) • Validation (range, format, presence, length) • Local or global variables used • Ability to handle data types (string/integer/Boolean) **Note:** this **must** be applied (AO2) to how the scenario can be solved using the language of the candidates' choice. (Limited by spec to VB Python and Java.)	6		2.1b		6

Band	AO2.1b
	Max 6 marks
3	**5-6 marks** The candidate has: • written an extended response that has a sustained line of reasoning which is coherent, relevant, and logically structured • 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 five to six relevant detailed points on the selection and justification of the proposed method of solution for the main requirements listed in the scenario • addressed the question appropriately with minimal repetition and no irrelevant material • presented a balanced discussion and justified their answer with examples • used appropriate technical terminology referring to the indicative content confidently and accurately.
2	**3-4 marks** The candidate has: • written a response that has an adequate line of reasoning with elements of coherence, relevance, and logical structure • shown adequate understanding of the requirements of the question and a satisfactory knowledge of the topic of changeover as specified in the indicative content. Satisfactory knowledge is defined as a response that provides three to four points on the selection and justification of the proposed method of solution for the main requirements listed in the scenario • presented a discussion with limited examples • used appropriate technical terminology referring to the indicative content.
1	**1-2 marks** The candidate has: • written a response that that lacks sufficient reasoning and structure • produced a discussion which is not well developed • attempted to address the question but has demonstrated superficial knowledge of the topics specified in the indicative content. Superficial knowledge is defined as a response that provides one to two points on the selection and justification of the proposed method of solution for the main requirements listed in the scenario • used limited technical terminology referring to the indicative content.
0	**0 marks** Response not credit worthy or not attempted.

Q	Answer	Mark	AO1	AO2	AO3	Total
3.	**Award 1 mark** for each bulleted point below: Must be in Transaction Class: • **+**accountNumber : Integer • +transactionID : Integer • + getAccountNumber() : Integer • + getTransactionID() : Integer • Arrow to show inheritance • -amount : Real • -setAmount(Real) **Indicative content:** | **Transaction** | | +accountNumber : Integer | | +transactionID : Integer | | + getAccountNumber() : Integer | | + getTransactionID() : Integer | △ | | **Credit** | | -amount : Real | | - setAmount(Real) |	1 1 1 1 1 1 1		2.1b		7

Q	Answer	Mark	AO1	AO2	AO3	Total
4. (a)	**Award 1 mark** for each correct number. 	1	2	3	4
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4.4	8.8	13.2	17.6		8		2.1a		16
(b)	**Award 1 mark** for each corrected line in correct location. (Bold lines below) ``` 1 start is integer 2 endv is integer 3 found is Boolean 4 mid is integer 5 6 set start = 0 7 set endv = 9999 8 set found = FALSE 9 10 input searchValue 11 12 repeat 13 set mid = (start + endv) DIV 2 14 if searchValue = stockCost[mid] then 15 set found = TRUE 16 Output "SearchValue found at position", Mid 17 endif 18 19 if searchValue > stockCost[mid] then 20 set start = mid + 1 21 endif 22 23 if searchValue < stockCost[mid] then 24 set endv = mid – 1 25 endif 26 until (found = TRUE) OR (endv < start) 27 28 if found = FALSE 29 Output "searchValue not found" 30 endif 31 End ```	8			3.1b	

Q	Answer	Mark	AO1	AO2	AO3	Total
1.	**Award 1 mark** for each corrected line of code to allow: **Indicative content:** • Definition of storage type • Defining a data structure • End if • Copying data into structure • End subroutine/method • Customised message for file saved • Counting found items • Outputting number counted	8			3.1b	8
2.	Clear annotation of steps within the following routines: • Setting up a data structure • Creating a new blank file • Copying data from screen textboxes to data structure • Writing of data to file • Retrieving data from file • Splitting into array/textboxes/variables • Looking/counting of items required • Validation	8			3.1a	8

Band	AO3.1a
	Max 8 marks
3	**7-8 marks** The candidate has: • Produced listings that are appropriately laid out and included sufficient annotation to demonstrate an understanding of **all** programming routines listed in the indicative content • Documented all code beyond self-documenting identifiers / explained variables • Used appropriate technical terminology referring to the indicative content confidently and accurately.
2	**4-6 marks** **Three** marks can be awarded if the candidate has: • Produced listings that are appropriately laid out and included sufficient annotation to demonstrate an understanding of **most** of the programming routines listed in the indicative content. Most of the routines are defined as four to six of the subroutines and procedure as listed in the indicative content. • Used appropriate technical terminology referring to the indicative content.
1	**1-3 marks** The candidate has: • Produced listings that are appropriately laid out and include sufficient annotation to demonstrate an understanding of **one to three of the** programming routine listed in the indicative content • Used limited technical terminology referring to the indicative content. OR • Documented only code that used self-documenting identifiers • Used limited technical terminology referring to the indicative content.
0	**0 marks** Response not credit worthy or not attempted.