GCE AS MARKING SCHEME

SUMMER 2023

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

INTRODUCTION

This marking scheme was used by WJEC for the 2023 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.

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Question	Answer	Mark	AO1	AO2	AO3	Total
1. (a)	**Award 1** mark for each:			2.1b		5
	• Name of Customers table is relevant	1				
	• Name of Bookings table is relevant	1				
	• Name of Trips table is relevant	1				
	• Correct relationship link from Customers to Bookings (1:M)	1				
	• Correct relationship from Trips to Bookings (1:M)	1				
	(must indicate many side for each mark above)					

Question	Answer	Mark	AO1	AO2	AO3	Total
1. (b)	**Any 2 tables from part 1a above:** **(Expected Customer and Bookings)**			2.1b		10
	Award max 2 marks for each bullet point					
	• Fieldnames (2 suitable fields in addition to KF)	1+1				
	• Data types (accept autonumber as type)	1+1				
	• Field lengths (accept single/double)	1+1				
	• Requirements for Validation (one mark for each type)	2				
	o Range, Format, Presence, Length . . .					
	• Foreign keys in booking table / Primary key in Customers and Trips	2				
	Max 10 marks.					
	Indicative content					
	Non-exhaustive example of Customers table:					

Fieldname	Keyfield	Data Type	Field Length	Validation
CustomerID	Yes-indexed	Integer	Single	Presence
Title	-	String	10	Lookup Mr, Mrs, Miss …
FirstName	-	String	25	Length
…	…	…	…	…
Postcode	-	String	9	Format LL00 0LL
DOB	-	Date	2/2/4	Range

Etc . .

Booking table:

Fieldname	Keyfield	Data Type	Field Length	Validation
BookingID	Yes-indexed	Integer	Single	Presence
CustomerID	Foreign key	Integer	Single	Type
TripID	Foreign Key	Integer	Single	Type
…	…	…	…	…

Question	Answer	Mark	AO1	AO2	AO3	Total
2.	**Indicative content for discussion:** • 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 methods of solution 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.

Question	Answer	Mark	AO1	AO2	AO3	Total
3.	**Indicative content:** • Standard clerical procedures, • Levels of permitted access, • Passwords for access to files/systems • Write-protect mechanisms • Validation (for integrity) • Backup (for integrity) • Encryption. • Antivirus **Note:** this **must** be applied (AO2) to the scenario.	7		2.1b		7

Band	AO2.1b
	Max 7 marks
3	**6-7 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 six to seven relevant detailed points on the topics listed in the indicative content. • 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	**3-5 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 five points on the topics listed in the indicative content. • 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. • terminology referring to the indicative content.
0	**0 marks** Response not credit worthy or not attempted.

Question	Answer	Mark	AO1	AO2	AO3	Total
4.	**Award** 1 mark for each correct number.					16
(a)		8		2.1a		

weight [i,1]	1	2	3	4
weight [i,2]	150	300	450	600

Note this is an AS AO3 question and must be identified and described in this context for the mark. Stating the line or number is helpful but insufficient to award the mark.

(b)	Award **one** mark for each correctly described line	8			3.1c	

- constant
  2 declare constant PASSENGERWEIGHT = 150
  Sets the value of PASSENGERWEIGHT to 150 and is not changeable later in the program

- local variable
  21 declare passengers is integer
  22 declare completed is Boolean
  Sets up a variable that is accessible only within the subroutine / main program.

- global variable
  1 declare weight[4,2] is real
  Sets a variable that can be accessed by the whole program at any time.

- self-documenting identifier
  2 PASSENGERWEIGHT
  A variable or subroutine declaration which is self-explanatory.

- annotation
  3 {average weight of a passenger}
  A line of non code/natural language which is intended to add explanation to a programmer. (Human)

- procedure calling
  5 completed = fillArray(passengers)
  A line of code that calls for the execution of a different routine

- parameter passing
  27 fillArray(passengers)
  Passing information to a different routine.

- return a value.
  13/15 return TRUE
  Returning a value from a subroutine when the program continues.

Question	Answer	Mark	AO1	AO2	AO3	Total
1.	**Award 1 mark for each corrected line of code:** **Indicative content:** • Declaration of main program • Declaration of Save subroutine • Declaration of count subroutine • Declaration for data type/structure etc.	4			3.1b	4
2.	Award **one** mark for each clear annotation of up to four of the following 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 Max 4 marks.	4			3.1a	4

3.	**Award 1 mark for each functional aspect of code from bullets below.**
	
	Indicative content:
	• New program exists and can be run
	  Includes:
	    o TripID
	    o Date
	    o Time (AM/PM)
	    o Description
	    o Save Button/function exists
	    o Load/recall Button/option exists
	• Usable/clear UI (GUI or CLI)
		8			3.1b	8