GCE AS MARKING SCHEME

SUMMER 2024

AS
COMPUTER SCIENCE - COMPONENT 2
B500U20-1

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

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 in **Component 2** the assessment grid advises the marks to allocate to responses which demonstrate the qualities needed in AO2 and AO3. There is limited indicative content as learner response will vary significantly, as the choice of solution will differ based on a variety of factors (e.g. IDE used, interface type chosen, file handling routine used). 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.

EDUQAS GCE AS COMPUTER SCIENCE

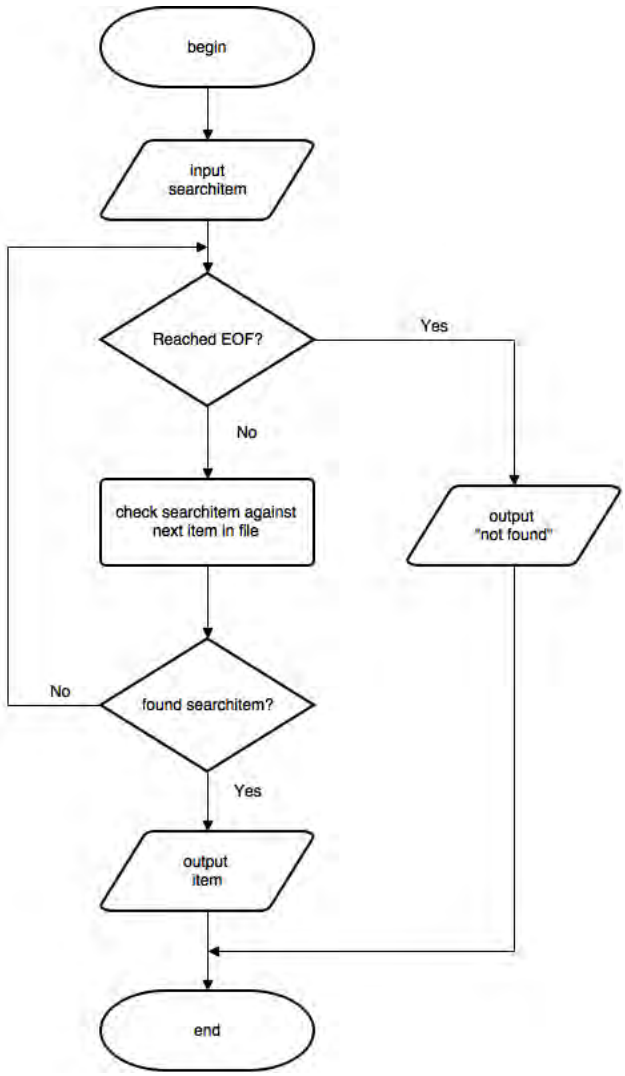
COMPONENT 2: PRACTICAL PROGRAMMING TO SOLVE PROBLEMS

SUMMER 2024 MARK SCHEME

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>AO1</th><th>AO2</th><th>AO3</th><th>Tot</th></tr>
<tr><td>1</td><td>Indicative content:

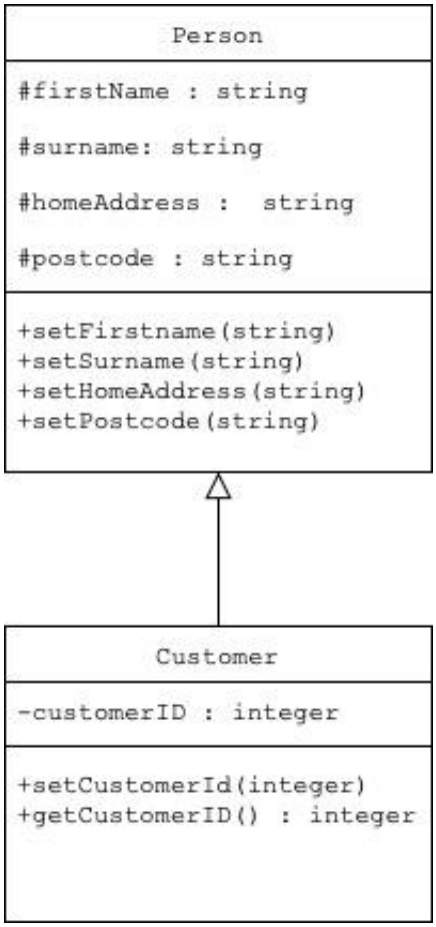
<table>
<tr><th>Fieldname</th><th>Key field</th><th>Data Type</th><th>Field Length</th><th>Validation</th></tr>
<tr><td>CustomerID</td><td>PK</td><td>Integer</td><td>5</td><td>Range >0</td></tr>
<tr><td>Firstname</td><td></td><td>String</td><td>30</td><td>Presence</td></tr>
<tr><td>Surname</td><td></td><td>String</td><td>30</td><td>Presence</td></tr>
<tr><td>Address</td><td></td><td>String</td><td>30</td><td>Presence</td></tr>
<tr><td>Postcode</td><td></td><td>String</td><td>8</td><td>Format</td></tr>
<tr><td>Telephone Number</td><td></td><td>String</td><td>12</td><td>Length</td></tr>
<tr><td>email</td><td></td><td>String</td><td>256</td><td>Format</td></tr>
<tr><td>etc</td><td></td><td></td><td></td><td></td></tr>
</table>

Award 1 mark for key field
Award 1 mark for each column title correct as above
Award 1 mark for each correct data type
Award 1 mark for correct field lengths
Award a maximum of 4 marks for suitable validation checks</td><td>8</td><td></td><td>2.1a</td><td></td><td>8</td></tr>
</table>

Q	Answer	Mark	AO1	AO2	AO3	Tot
2	**Indicative content:**  Award **one mark** for: • Correct symbols • Correct decision (search match for details. e.g. CustomerID = "1234") • Correct use of a loop • Correct use of terminating condition • Correct output (return details and return not found) • Beginning and end terminators can be reached Notes: There may be many valid ways to solve the problem.	6		2.1b		6

Q	Answer	Mark	AO1	AO2	AO3	Tot
3	**Indicative content:** **Answer must be within the context of PVCC scenario:** Backups of all data should be made regularly as the older the backed-up data becomes, the less likely it is to match any current data stored on a computer system. Possible backup methods and secondary storage: **Cloud storage**: PVCC have limited data and so would be able to copy the **data offsite over an internet** connection **continuously**. **Magnetic tape** classically used to store backups: Inexpensive medium and so **affordable** to a small company. They could have a **backup policy of rotating the tapes as in a grandfather father son** system. **External Hard disk**: Limited data would mean that making a copy would be practical for the company. **Make a copy each night/once a week and take off site** Reason for backing up: Backups protect data following primary data loss. Generations of files, e.g. the grandfather-father-son regime, allows data to be restored to a previous version following catastrophic data loss. PVCC would have 3 copies of the data to roll back. PVCC could have a backup policy: A backup policy sets out how often and to what medium backups are made. The backup medium is generally different to the active storage medium.	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 all relevant detailed points on the selection and justification of the proposed method of solution for 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 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 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 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	Tot
4	**Indicative content:**  Award **1 mark** only for **each** one of: Superclass Person Subclass Customer Correct inheritance order (arrow pointing to Person) 4 methods in Person 4 protected attributes in Person 2 methods in Customer 1 private attribute in Customer 4 string parameters in Person 1 Integer parameter in Customer 1 Integer returned from method (getCustomerID) all methods public (+) correct notation used	12			3.1a	12

Q	Answer	Mark	AO1	AO2	AO3	Tot

5	Any valid/functional search or comparison-based algorithm that returns outputs as stated in question:
	
	Example
	
	`01 set i = 0`
	`02 declare lowestprice is integer`
	`03 declare highestprice is integer`
	`04 declare found is boolean`
	`05 set found = false`
	`06 output "Please enter lowest price"`
	`07 input lowestprice`
	`08 output "Please enter highest price"`
	`09 input highestprice`
	`10 repeat`
	`11  if stockArray[i,1]>lowestprice then`
	`12   if stockArray[i,1]<highestprice then`
	`13    set found = True`
	`14    output "Stock ID:",stockArray[i,0]`
	`15    output "Price :", stockArray[i,1]`
	
	`16   end if`
	`17  end if`
	`18  set i = i + 1`
	`19 until (i > LEN(stockArray))`
	`20 if found = false then`
	`21  output "No Match Found"`
	`22 end if`
	
	One mark for each:
	• initialise variables
	• use of a loop
	• comparisons
	• uses a flag to track "found / not found"
	• use of terminating condition
	• correct outputs
	• One numerically correct output
	• All numerically correct outputs
	
	Marks awarded for concepts demonstrated above. Other solutions incorporating above concepts that provide exactly the same result are to be awarded the mark.
		8			3.1b	8

Q	Answer	Mark	AO1	AO2	AO3	Tot
6a	**Indicative content:** • Button available to save stock data • Data saves in PVStock.txt • Button available to count stock attributes • The number appears on screen (in any form)	4			3.1b	4

Band	AO3.1b Max 4 marks
3	**4 marks** **The candidate has:** • Implemented all the points required as stated in the indicative content • Used and fully exploited the programming facilities of the language • Demonstrated a sound understanding of the appropriate tools and techniques available to them
2	**2-3 marks** **The candidate has:** • Implemented the majority of the points required as stated in the indicative content. Majority is defined as a response that provides 2 or 3 items of the functionality signalled in the indicative content • Used and exploited the programming facilities of the language • Demonstrated an understanding of the tools and techniques available to them
1	**1 mark** The candidate has: • Implemented only one of the points required as stated in the indicative content • Used some of the programming facilities of the language • Demonstrated a limited understanding of the tools and techniques available to them
0	**0 marks** Response not credit worthy or not attempted

Q	Answer	Mark	AO1	AO2	AO3	Total
6b	**Indicative content:** • New form exists • New form has a title • Inputs data **up to a maximum of one mark** (any validation method from): o Range check o Format check o Length check o Presence check o Lookup check o Drop down menu o Type check • Creates a data file called PVCustomer.txt • Stores on disk in any file • Stores on disk in a text file called PVCustomer.txt • Descriptive/useful feedback that file has been saved • Candidates may use custom data types / standard methods • Retrieves any data from disk • Retrieves specific item from disk • Retrieves specific entry details from disk (Candidates may use random (direct), serial, or sequential file access) • HCI fit for purpose (Textual or GUI)	12			3.1b	12

Band	AO3.1b Max 12 marks
3	**9-12 marks** The candidate has: • Created a new program including all or the majority of the functionality as required in the question and stated in the indicative content. The majority of the functionality is defined as a response that provides 9 to 12 items of the functionality signalled in the indicative content • Used and fully exploited the programming facilities of the language • Demonstrated a sound understanding of the appropriate tools and techniques available to them • Written code that is well structured • Provided evidence of a completed user interface which aids user interaction and is intuitive
2	**5-8 marks** The candidate has: • Created a new program including most of the functionality as required in the question and stated in the indicative content. Most of the functionality is defined as a response that provides five to eight items of the functionality signalled in the indicative content • Made use of an appropriate range of the programming facilities of the language • Demonstrated an understanding of the tools and techniques available to them • Provided evidence of a completed user interface which aids user interaction
1	**1-4marks** The candidate has: • Created a new program with a limited range of the functionality as stated in the indicative content or improved the prototype provided by adding a limited range of the new functionality as stated in the indicative content. A limited range of functionality is defined as a response that provides one to four items of the functionality signalled in the indicative content • Used a limited range of the programming facilities of the language • Demonstrated a limited understanding of the tools and techniques available to them • Provided evidence of a user interface
0	**0 marks** Response not credit worthy or not attempted.

Q	Answer	Mark	AO1	AO2	AO3	Total
6c	**Indicative content:** Clear annotation of steps within the following routines: • Annotation of any validation • Stores on disk in any file • Retrieves specific item from disk • Use of self-documenting identifiers / explanation of variables	4			3.1a	4

Band	AO3.1a Max 4 marks
3	**4 marks** **The candidate has:** • Produced listings that are appropriately laid out and included sufficient annotation to demonstrate an understanding of **most** or **all** programming routines listed in the indicative content • Written code using self-documenting identifiers / explained variables • Used appropriate technical terminology referring to the indicative content confidently and accurately.
2	**2-3 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 **all** programming routines listed in the indicative content • Not written code using self-documenting identifiers / not explained variables • Used appropriate technical terminology referring to the indicative content. **OR** • Produced listings that are appropriately laid out and included sufficient annotation to demonstrate an understanding of **two** of the programming routines listed in the indicative content • Written code using self-documenting identifiers / explained variables • Used appropriate technical terminology referring to the indicative content. **Two** marks can be awarded if the candidate has: • Produced listings that are appropriately laid out and included sufficient annotation to demonstrate an understanding of **two** of the programming routines listed in the indicative content • Not written code using self-documenting identifiers / not explained variables • Used appropriate technical terminology referring to the indicative content. **OR** • Produced listings that are appropriately laid out and included sufficient annotation to demonstrate an understanding of **one** of the programming routines listed in the indicative content • Written code using self-documenting identifiers / explained variables • Used appropriate technical terminology referring to the indicative content.
1	**1 mark** **The candidate has:** • Produced listings that are appropriately laid out and include sufficient annotation to demonstrate an understanding of **one** programming routine listed in the indicative content • Used limited technical terminology referring to the indicative content. **OR** • Written code using self-documenting identifiers • Used limited technical terminology referring to the indicative content.
0	**0 marks** Response not credit worthy or not attempted.