GCE MARKING SCHEME

SUMMER 2016

COMPUTING CG1 (LEGACY)
1101/01

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INTRODUCTION

This marking scheme was used by WJEC for the 2016 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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GCE COMPUTING - UNIT CG1
Mark Scheme - June 2016 QPEC

Q	Answer	Mark
1(a)	Award 1 mark per correct stage • They first need to create a standard letter with the details of the open evening • Next insert the fields such as name and address from the database • Use the mail merge facility to combine the data with the letter	1 1 1
1(b)	Award a maximum of 3 marks, 1 mark for each from Data is fairly and lawfully processed Personal data shall be adequate, relevant and not excessive Data must be accurate and up to date Data can only be transferred outside EC to countries with adequate DP legislation Processed in line with your rights Data is processed for limited purposes Do not award a mark for Held securely Personal data stored for no longer than necessary	3
2	Award one mark for naming the data type **and** an example Real - 3.7 (accept real world example if obvious real such as height in metres) Character (accept char) - A (accept description as example such as a letter) String - Bob (accept description as example such as someone's name) Boolean - True Integer - 4 (accept real world example if obvious integer such as age)	5
3	Award one mark for problem, one mark for solution. Solution **must** follow problem. Problems with a paper-based system: Any three of: A. Paper based systems are difficult and/or time consuming to back up as each piece of paper will have to be copied NOT just 'difficult to back up' alone B. Difficult and time consuming to amend/add details/easy to make mistakes C. Difficult to sort paper records manually into a prescribed order D. Difficult to copy to give to someone else or move E. Difficult to encrypt so accessible if stolen F. Difficult to analyse data / produce meaningful reports G. Difficult for multiple persons to look at the same record Solution (which must follow problem described above) A. Easy to back up a computerised database B. It is easy to overwrite / amend / update data in a database/validate to minimise errors C. Can easily sort based on a prescribed field D. Easy to copy and transport E. Easy to encrypt so not compromised if stolen F. Easy to analyse data / produce meaningful reports G. Many people can view the same record (only one can update)	6

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4(a)	Award one for situation and one for reason. Many sensible situations for compressing a file exist including: • To send as an email attachment as smaller files transfer quicker or may have maximum size of an attachment • Upload to a web site as larger files take longer to upload or might be restrictions on maximum file size that can be uploaded • Saving a file to disc if short on disc space or to save disc space	1+1
4(b)(i)	Award one mark for each character combinations that occur more than once – max two 'at' appears in the sentence 3 times 'he' occurs twice 't ' (t space) occurs twice 'e ' (e space) occurs twice	2
4(b)(ii)	Award one mark for a **suitable** substitute not commonly found in English/Welsh language sentences for example → ~ ¬ Alternatives cannot be a letter or any possible punctuation that might legitimately occur in an English/welsh sentence	1
4(b)(iii)	Award one mark for The character would not sensibly occur in a text file of English sentences	1
5(a)	Award up to 6 marks Candidates are expected to give a full description of the problems of using voice recognition for vocabulary dictation which include: • The system will have to be set up and trained to recognise user's voice which might be difficult or will take time • System may not recognise two words that sound the same such as 'two' and 'to' • System may not recognise vocabulary dictation due to user's voice being unclear as a result of a cold or sore throat • System may not recognise colloquialisms or local dialect • System may not recognise vocabulary dictation as background noise is more likely to interfere with words used in everyday English/Welsh language • System may not recognise proper nouns such as 'Nantyfyllon' • Dictation could be mistaken for a command word for example open / close /save • Punctuation could be mistaken for text for example . for full stop Criteria Marked 5 - 6 marks Candidates give a clear, coherent answer fully and accurately describing at least three of the problems of using voice recognition for vocabulary dictation 3 - 4 marks Candidates describe at least two problems of using voice recognition for vocabulary dictation 1 - 2 marks Candidates briefly state at least one of the problems of using voice recognition for vocabulary dictation 0 marks No appropriate response	6

<table>
<tr><td>5(b)</td><td>Award one mark for the situation and one mark for why it's used.

Many situation exist, examples are:

Mobile devices as other input devices are small or using hands for holding device or doing something else and because there are a limited set of distinct commands

Audio devices in cars as using hands for something else and because there are a limited set of distinct commands

Automated telephone conversations – recognise numbers or limited set of distinct commands

Disabled users who cannot use a keyboard could use voice input to control the computer

Accepted but not expected - Security entry systems as voice patterns can be used as a biometric</td><td>1+1</td></tr>
<tr><td>6(a)</td><td>The check must be described correctly with enough detail so that it is clear that the invalid data would be detected by the check described.

Award one mark for check correctly described.
Award one mark for an example of invalid data that the check described would detect.

<table><tr><th>Suitable checks</th><th>Example of invalid data</th></tr><tr><td>Range check to ensure data is between sensible limits for example 0 and 999 999</td><td>12000000, -23</td></tr><tr><td>Format chk to ensure data follows a set pattern for example " £ #### "</td><td>$ 200</td></tr><tr><td>Type check to ensure that a data item is of a particular type; for example, all entries should be digits</td><td>Bob or 160j</td></tr></table>
NOTE - Example of invalid data must follow check described</td><td>1
1</td></tr>
<tr><td>6(b)</td><td>The check must be different and described correctly with enough detail so that it is clear that the invalid data would be detected by the check described.

Award one mark for check correctly described.
Award one mark for an example of invalid data that the check described would detect.

<table><tr><th>Suitable checks</th><th>Example of invalid data</th></tr><tr><td>Lookup check where user is presented with a limited choice for example 1 to 9 in this case</td><td>Not selecting a value from the list</td></tr><tr><td>Range check to ensure data is between sensible limits for example 0 and 10</td><td>12, -2</td></tr><tr><td>Type check to ensure that a data item is of a particular type; for example, all entries should be digits</td><td>Bob or 160j</td></tr></table>
NOTE - Example of invalid data must follow check described</td><td>1
1</td></tr>
</table>

6(c)	Award 1 mark for : Data is typed twice / Data is entered Award 1 mark for one of the following : and compared if they do not match then there has been an error and user is asked to confirm accuracy if they do not confirm, there is an error data is compared to a pre-stored list and if not found there is an error	 1 1

7	Award up to 4 marks per response
	
	Starting at the beginning of the array and SearchValue is **compared to every consecutive item** (1) in SearchArray until either an item **matches** (1) SearchValue or the **end of the array is reached**(1) or an item in the array is **found to be bigger** than Searchvalue (1).
	
	Alternatively candidate could give an algorithm - accepted not expected
	
	i = 1
	repeat
	if SearchValue = SearchArray(i) then
	item found
	increment i
	until (item found) or (end of array) or (SearchValue > SearchArray(i))
	
	Marking of algorithm
	Comparison and increment (1)
	Terminating loop conditions (3 x 1)
		4

8(a)	Award 1 mark each for Data Flow Diagram (CAO, Do not accept DFD) External entity (CAO) 	 1 1 1
8(b)	Award 1 mark each for A - customer enquiry / request / requirements (must be a suitable noun) B - dealer enquiry / query / jewellery details (must be a suitable noun) C - availability report / result of query / suitable items details (must be a suitable noun) D – jewellery available or not available (must be a suitable noun)	 1 1 1 1
9	Award 1 mark per response M = -3 then output is "Number input must be greater than zero" M = 3 then output is 3 6 9 12	 1 4

10(a)	Award 1 mark per response Alpha testing would sensibly be carried carry out by testers or developers within the developer's own company Beta testing would sensibly be carried carry out by a number of (privileged or existing) customers in exchange for their constructive comments Acceptance testing would sensibly be carried carry out by a the prospective customer	 1 1 1
10(b)	Award 1 mark per response An example of corrective maintenance is when a bug is found like an incorrect calculation and the program is corrected, and the calculation changed to produce the correct result An example of adaptive maintenance is when the program has to be altered to run on a different operating system like when a desk top application running on Windows has to be adapted to run on a mobile device / change in law for example change in rate of VAT An example of perfective maintenance is when the program's performance is improved like when a search algorithm is amended to produce results quicker	 1 1 1
11	Award up to 6 marks per response Answers could refer to The difference between fixed and variable length records is that a fixed length record has same number of bytes in each record (and same number of fields) but a variable length record has different number of bytes in each record (or different number of fields). Fixed length record is easier to program as it can be calculated how much storage space will be required Variable length record makes it difficult to calculate how much storage space will be required Fixed length records are quicker to process (read/write) by computer as start and end locations are known Variable length records are slower to process (read/write) by computer as start and end locations have to be calculated at read/write time Fixed length record wastes storage space as fields have blank space Variable length record saves storage space as no blank space Fixed length record will truncate long fields Variable length record avoids truncation as each field can extend to accommodate any number of characters Criteria Marked 5 - 6 marks Candidates give a clear, coherent answer fully describing the **difference** between fixed and variable length records. The **distinct** advantages and disadvantages of programming with each are described in detail. 1 - 4 marks Candidates give an answer describing the advantages and disadvantages of programming with each type of record. 0 marks No appropriate response	6

	Do not credit reverse responses Sample response of an extended answer worth six marks: *The difference between fixed and variable length records is that a fixed length record has same number of bytes in each record but a variable length record has different number of bytes in each record.* *Fixed length records are easier to program as it can be calculated know how much storage space will be required but a variable length record makes it difficult to calculate how much storage space will be required. Fixed length records are quicker to process (read/write) by computer as start and end locations are known but variable length records are slower to process (read/write) by computer as start and end locations have to be calculated at read/write time. Fixed length record wastes storage space as fields have blank space whereas variable length record saves storage space as no blank space.*	
12(a)	Award 1 mark per response 4 SwapMade is **Boolean** 10 start 11 set Temp = **SortArray[i]** 12 set SortArray[i] = **SortArray[i + 1]** 13 set **SortArray[i + 1] = Temp** 14 end 21 set SwapMade = **FALSE**	1 1 1 1 1
12(b)	Award 1 mark for Purpose of algorithm is to swap (consecutive) two elements of an array	1
13	Award 1 mark per response up to 4 marks Accidental damage is when data is unintentionally amended or deleted Malicious damage is when data is intentionally amended or deleted One circumstance where accidental damage might occur is customers or shop employees deleting or amending payment details by accident this could be prevented by making data read only/confirmation dialogue box Award 1 mark per response up to 2 marks either One circumstance where malicious damage might occur is hackers (or similar) deleting or amending payment details on purpose this could be prevented by ensuring the data is protected by passwords/firewall OR Another circumstance where malicious damage might occur is a disgruntled store employees deleting or amending payment details on purpose this could be prevented by only allowing certain employees write access rights to the data	6

14	Award up to 6 marks per response Answers could refer to Drawbacks of using social networking web sites • People may not be telling the truth and difficult to detect with no face to face contact • May come into contact with people trying to sell illegal material such as drugs / weapons / pornography / paedophiles • Site may be used for 'cyber bullying' • Lack of 'real' social contact may lead to losing social skills • RSI / posture/ eye / obesity problems from prolonged computer use • Distraction from 'real work' • May download virus • Information may be from parties with other reasons such as retailers suggesting their product • Employers/university may see inappropriate behaviour which stops someone getting a job / university place Benefits of using social networking web sites • Can chat with or make new friends with similar interests • Can post messages to groups of people • Easy to keep up to date with what friends/family are doing • Other children may know other 'good web sites' • Can chat with or make new friends from all over the world (only once) • Can find out information and receive answers to questions • Can be cheaper to talk using this method compared to the telephone – must be justified • Share music, photographs or videos • Some people find it easier to talk to strangers particularly about personal issues • Can set up and join 'interest' groups • Can set up and join groups to solve injustices or raise money for good causes • Employers/university may see positive behaviour which helps someone getting a job / university place • Ability to insert hyperlinks to share with others • Can communicate in real time Criteria marked marks may be awarded for an extension of any of the benefits or drawbacks by giving examples or more detail. 4 - 6 marks Candidates give clear extended answers describing benefits and drawbacks of social networking web sites. 1 - 3 marks Candidates briefly describe up to three benefits and/or drawbacks of social networking web sites. 0 marks No appropriate response	6

	Example of an extended an answer (three bullet points extended - worth six marks): It is possible to make new friends on these web sites that you would never meet as they might live abroad and they might have similar interests to you which people in your area don't have. Some people on these sites may not be telling the truth and might lie about their age and as you cannot see them it is difficult to know who is lying and who is not whereas if you were speaking to them you could guess how old they were. If you spend all of your time on these web sites you will miss 'real' social contact with friends and real people and this may lead to not knowing how to behave in real society as people can get away with saying something on-line that they would never say face-to-face. Also you might not exercise as much and could become obese but social web sites have been set up to help raise money for charity and awareness on injustices.	
15	Award up to 6 marks per response Answers could refer to Manages peripherals such as input and output devices Communicates with and sends data output to a printer / monitor / other valid output device Communicates with and receives data input to a keyboard / mouse / other valid input device Spooling Data is stored on hard disc/in memory / stored in a queue Document is printed when printer is free / in correct order Benefit of spooling - User can carry on working / log off when waiting for job to print Manages backing store Ensures that data is stored and can be retrieved correctly from any disc drive Creates and maintains Filing system such as FAT or NTFS (accepted but not expected) Organise files in a hierarchical directory structure. File compression The amount of data is reduced and the file is made smaller Compression is used to save disc space Disc de-fragmentation Fragmented files are split up and stored on different parts of the disc Disc fragmentation will slow down disc access speed Disc de-fragmentation is when file parts are physically re-arranged (re-organised, moved, re-ordered) on disc (into the order required for access) Manages memory (RAM) Ensures programs / data do not corrupt each other Ensures all programs and data including itself is stored in correct memory locations Manages processes Ensures different processes can utilise the CPU and do not interfere with each other or crash On a multi-tasking O/S ensure that all tasks appear to run simultaneously	6

	Criteria marking 5 - 6 marks Candidates give a clear, coherent answer fully and accurately describing how the operating system manages at least three resources 3 - 4 marks Candidates describe how the operating system manages at least two resources 1 - 2 marks Candidates briefly describe or simply lists at least one resource managed by the operating system 0 marks No appropriate response	
16	Award up to 11 marks per response Answers could refer to Study the existing system documentation - This is suitable for investigating current data storage requirements or data flow Benefits Team can see how current system 'should' be operating Inexpensive method of gathering lots of information fairly quickly Can identify storage requirements Drawbacks Staff may not be following procedures in documentation and may be using system in their own way Documentation may be out of date and not updated to reflect system changes Carry out a questionnaire of staff - This is suitable because the staff might be spread over a wide geographical area and there are many of them. Benefits Relatively cheap to produce for a large number of people Can be distributed worldwide Could be completed on-line/email so results can be available very quickly Could be completed and analysed very quickly Drawbacks Have to be designed by experts or information could be unusable People are 'too busy' and may not complete People may not give correct answers Interview staff - This is suitable when the analysts require a lot of information from a small number of people such as key staff Benefits Can gather large amount of detailed information Can make judgements on validity of information from personal contact or body language Can ask 'follow up' or 'open ended' questions to gather more detailed information in selected areas	11

	Drawbacks Time consuming and expensive to carry out Has to be carried out by trained interviewer or closed questions written by experts Difficult to analyse large amount of information Difficult to analyse wide variety of information Observe the current system in practice - This is suitable for gathering information first hand Benefits Can actually see what is really happening and do not have to rely on what people tell you what they think is happening Drawbacks Very time consuming and therefore expensive to carry out Staff may feel like they are being watched and therefore behave differently so do not actually see what goes on every day Cost of sending analysts around the world. The description, benefits or drawbacks of any of the methods could be extended with more detail and gain extra marks. Criteria marked 9 – 11 marks Candidates give a clear, coherent answer fully and accurately describing four methods of investigation and the purpose. They use appropriate terminology and accurate spelling, punctuation and grammar. 6 - 8 marks Candidates give a clear, coherent answer fully and accurately describing at least three methods of investigation and the purpose. They use appropriate terminology and accurate spelling, punctuation and grammar. 3 – 5 marks Candidates give a clear, coherent answer describing at least two methods of investigation. There are a few errors in terminology and accurate spelling, punctuation and grammar. 1 - 2 marks Candidates give an answer simply listing methods of investigation. There are significant errors in spelling, punctuation and grammar. 0 marks No appropriate response	
	Total	100