



GCE MARKING SCHEME

SUMMER 2016

**COMPUTING CG3
1103/01**

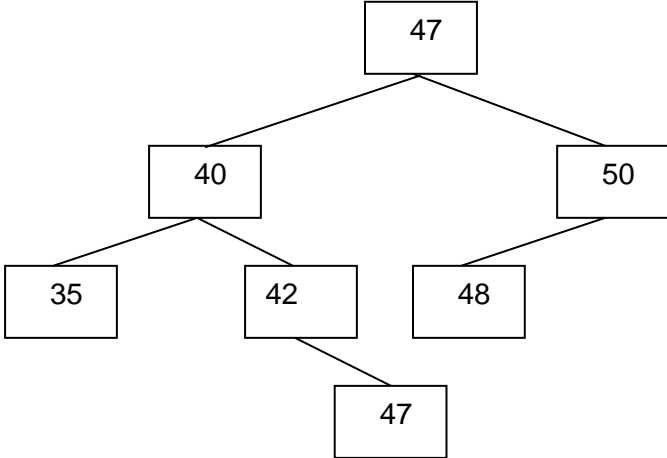
INTRODUCTION

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.

Question	Answer	Mark	Max Mark
1	<p>Award one mark per point.</p> <p>A web log is a set of entries on the world wide web / on-line / virtual environment which is accessible to any web user.</p> <p>The politician could add items including political views, plans etc. to keep their followers up-to-date with their activities.</p>	1 1	2
2	<p>Award one mark per point.</p> <p>Ecommerce is the use of <u>computer technology</u> (particularly the Internet).</p> <p>for commercial operations like sales from businesses to customers or from business to other businesses.</p> <p>Many people are concerned over security issues, (since customers are often required to give credit / debit card details over the Internet).</p> <p>Other possible concerns include:</p> <ul style="list-style-type: none"> • impersonal nature of ecommerce) acceptable if there is • effect on high streets - shops closing) some discussion as • effect on employment - shops closing) in the security answer • impossible to see product before purchase • not easy to return (faulty) items. 	1 1 1	3
3	<p>Award one mark for</p> <p>Because many input devices (e.g. microphones, sensors producing continuously varying voltage etc.) produce an analogue signal not a digital signal.</p>	1	1
4	<p>Award one mark per point.</p> <p>Rounding: number is approximated to <u>nearest</u> whole number/tenth/hundredth, etc.</p> <p>Truncating: number is approximated to whole number/tenth/hundredth, etc., <u>nearer zero</u> (condone <i>lower</i>).</p> <p>Example: e.g. 23.67 rounded to nearest integer = 24 23.67 truncated to nearest integer = 23</p> <p>[Marking: must be one example giving different results].</p>	1 1 1	3
5	<p>Award one mark per point.</p> <p>A (three) generation file backup system involves storage of several (three) of the most recent versions of <u>master file</u> (+ transaction file).</p> <p>Useful if one version is corrupted: the previous version(s) is still available.</p>	1 1	2
6	<p>Award one mark per point.</p> <p>Disaster planning (accept contingency planning).</p> <p>Elements of disaster planning: any 3 of:</p> <ul style="list-style-type: none"> • Files should be archived off-site • There should be an alternative / backup system • There should be a back-up power supply • Staff should be trained for this situation/there should be instructions. <p>NOT data backup as it's in the question.</p>	1 3	4

9	<p>Award one mark per point. An interrupt is a signal generated by a device or software, which may cause a break in the execution of the current routine.</p> <p>NOTE – do not accept an interrupt is generated when there is a fault (this is an example not a description).</p> <p>Examples - Any two of:</p> <ul style="list-style-type: none"> • Hardware or Software fault • Input/output device requesting attention, e.g. printer out of paper / requesting more data / key press / mouse click • User interrupt e.g. <ctrl> <break> • Operating system generated interrupt, e.g. end of time slice • Run time error, e.g. division by zero. <p>Another interrupt arises: [in this order]</p> <ul style="list-style-type: none"> • O/S suspends current interrupt routine • Runs the new higher priority interrupt routine • Finally, the O/S returns to original interrupt routine and continues. 	<p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p>	6
10	<p>Award one mark per point. Multi-tasking occurs when more than one task or application is available to the user at the same time.</p> <p>The user can decide to switch from one task to another.</p> <p>Example: Could be using e.g. a word processor and a browser at the same time on a single computer.</p>	<p>1</p> <p>1</p> <p>1</p>	3
11	Award one mark for Root (node).	1	1
12	<p>Award a mark for each correct level.</p>  <pre> graph TD 47 --> 40 47 --> 50 40 --> 35 40 --> 42 50 --> 48 42 --> 47 </pre>	3	3

13	<p>Award one mark per point. The tree would be asymmetrical / the left side would be longer / it would no longer be approximately balanced.</p> <p>Search times would become longer (as it is now more like a linked list).</p>	1 1	2
14	<p>Award one mark for It is unambiguous.</p>	1	1
15	<p>Award one mark per point.</p> <p>Award one mark for attempted recursion even if incorrect: same item Left and Right + other item(s) on Right are needed.</p> <p>Can't get 4 unless completely correct. Notation error max 1 mark lost.</p> <p><letter> ::= a b c . . . z (condone any upper case letters) <digit> ::= 0 1 2 . . . 9 (condone no zero) <name> ::= <letter> <letter><name> <email_ad> ::= <name>.<name><digit>@<name>.mid.ac.uk</p>	1 1 1 1	4
16	<p>Award one mark per point. Problem: many-to-many relationship (cannot be satisfactorily resolved).</p> <p>Solution: any one of:</p> <ul style="list-style-type: none"> • a link table/entity is required to remove the many-to-many relationship • data needs to be normalised. <p>(If diagram provided, it must be explained).</p>	1 1	2
17	<p>Award one mark per point up to a maximum of 4 Normalisation:</p> <ul style="list-style-type: none"> • is a way of structuring data according to theoretical rules • normalising data usually reduces data duplication/redundancy • avoids danger of inconsistency / maintains integrity • avoids danger of data being lost during update • avoids wasting processing time • probably enables easier maintenance of the database • allows different views of the data. 	4x1	4
18	<p>Award one mark per point Moving from:</p> <ul style="list-style-type: none"> • unnormalised data to 1NF involves ensuring there are no repeating attributes/groups/attributes should be atomic (accepted not expected) • 1NF -> 2NF involves ensuring there are no partial dependencies • 2NF -> 3NF involves there are no transitive/non key dependencies. <p>In each case a description (maybe with examples) is fine. For 3NF accept attributes are dependent on <i>the key, the whole key and nothing but the key.</i> If just a good definition of 3NF – award a maximum of one mark.</p>	1 1 1	3

23	<p>Award one mark per point. Procedural languages are concerned with carrying out an <u>ordered</u> set of instructions.</p> <p>Non-procedural languages are to do with <u>facts</u> / <u>rules</u> / <u>queries</u> [Two of the above are needed for the mark for non-procedural].</p>	1 1	2
24	<p>Award one mark per point. <u>4GL</u> used in (e.g.) a relational database system as a query / manipulation language.</p> <p><u>Why:</u> aimed at end-users / relatively close to natural language / requires less programming skill.</p> <p><u>Visual Language:</u> used for production of objects / buttons / icons / GUI / Windows / graphics content / event driven environment.</p> <p><u>Why:</u> may be easier to learn / more intuitive because visual / good help / tools available.</p>	1 1 1 1	4
25	<p>Award one mark for: A scripting language is often embedded in other languages and can add functionality to web pages, etc.</p> <p>(Accepted not expected): Scripting can be used in systems programming (e.g. shell scripts) in lieu of using a fully functional language (e.g. instead of C).</p>	1	1
26	<p>Award one mark for: any one of:</p> <ul style="list-style-type: none"> • If programmer A modifies current version, and programmer B modifies an earlier version, neither new version will contain both modifications • Any amendments must be made to the most recent versions. <p>(Accepted not expected): Can roll back any changes made.</p>	1	1
27	<p>Award one mark per point. <u>Break point:</u> allows the programmer temporarily to halt execution in order to ascertain the value of variables at that point (or to step through the program from that point).</p> <p><u>Variable watch:</u> lists the value of a variable at specific points during the execution.</p> <p><u>Store dump:</u> lists the entire contents of memory at a specific point.</p>	1 1 1	3
28	<p>Award one mark per point. Parallel processing is the simultaneous use of several processors (accept two) / cores to perform a single task.</p> <p>PP could be useful in (for instance) weather forecasting or image processing (where an extremely large/complicated calculation is being carried out).</p>	1 1	2

29	<p>Award one mark per point for any six of</p> <p>Circuit switching:</p> <ul style="list-style-type: none"> • A path is set up between the sender and receiver • All data follows the same path, in order • The path cannot be used by any other data until it is released. <p>Packet switching:</p> <ul style="list-style-type: none"> • The data is split into packets • Each packet may be transmitted by different routes • Packets may arrive out of order and are re-assembled • NOT FASTER. <p>Packet switch is generally preferred as it:</p> <ul style="list-style-type: none"> • Offers better security as it is very difficult to intercept • Offers more efficient use of data lines as there is no waiting during gaps • Is less likely to be affected by network failure etc. <p>An example of a strong extended answer worth six marks is:</p> <p>Circuit switching is where a path is set up between the sender and receiver before the start of transmission and is kept open until the end of transmission. All data follows the same path, in order. The path cannot be used by any other data during the transmission.</p> <p>Packet switching is where the data is split into packets before transmission. Each packet may be transmitted by different routes through network. They may arrive out of order and are re-assembled on arrival.</p> <p>Packet switching is usually preferred because it results in better security as it is very difficult to intercept and reconstruct the packets. Packet switching also promotes the more efficient use of data lines as there is no waiting during gaps.</p> <p>Max 5 marks if last part of question not addressed (explaining why packet switching is preferred)</p>	6 x 1	6								
30	<p>Criteria marked</p> <table border="1" data-bbox="284 1451 1200 1854"> <tr> <td data-bbox="284 1451 402 1541">10-12 marks</td> <td data-bbox="402 1451 1200 1541">Candidates give a clear, coherent answer fully and accurately describing and explaining all areas. They use appropriate terminology and accurate spelling, punctuation and grammar.</td> </tr> <tr> <td data-bbox="284 1541 402 1630">7-9 marks</td> <td data-bbox="402 1541 1200 1630">Candidates describe and explain a range of a least four of the areas, but responses lack clarity. There are some errors in spelling, punctuation and grammar.</td> </tr> <tr> <td data-bbox="284 1630 402 1720">4-6 marks</td> <td data-bbox="402 1630 1200 1720">Candidates describe and explain a range of a least three of the areas, but responses lack clarity. There are a few errors in spelling, punctuation and grammar.</td> </tr> <tr> <td data-bbox="284 1720 402 1854">1-3 marks</td> <td data-bbox="402 1720 1200 1854">Candidates simply list a range of points or give a brief explanation of one or two of the areas. The response lacks clarity and there are significant errors in spelling, punctuation and grammar</td> </tr> </table> <p>Award a maximum of 10 if only 4 sections attempted. Award a maximum of 8 if only 3 sections attempted. Award a maximum of 6 if only 2 sections attempted. Award a maximum of 4 if only 3 sections attempted.</p>	10-12 marks	Candidates give a clear, coherent answer fully and accurately describing and explaining all areas. They use appropriate terminology and accurate spelling, punctuation and grammar.	7-9 marks	Candidates describe and explain a range of a least four of the areas, but responses lack clarity. There are some errors in spelling, punctuation and grammar.	4-6 marks	Candidates describe and explain a range of a least three of the areas, but responses lack clarity. There are a few errors in spelling, punctuation and grammar.	1-3 marks	Candidates simply list a range of points or give a brief explanation of one or two of the areas. The response lacks clarity and there are significant errors in spelling, punctuation and grammar		12
10-12 marks	Candidates give a clear, coherent answer fully and accurately describing and explaining all areas. They use appropriate terminology and accurate spelling, punctuation and grammar.										
7-9 marks	Candidates describe and explain a range of a least four of the areas, but responses lack clarity. There are some errors in spelling, punctuation and grammar.										
4-6 marks	Candidates describe and explain a range of a least three of the areas, but responses lack clarity. There are a few errors in spelling, punctuation and grammar.										
1-3 marks	Candidates simply list a range of points or give a brief explanation of one or two of the areas. The response lacks clarity and there are significant errors in spelling, punctuation and grammar										

Text-based interface

- input to the computer is via typed text, probably via a command prompt
- text-based system can allow complex/unusual commands - may not be available via a GUI
- text-based system may run more quickly than a GUI / requires fewer resources
- may be very efficient for an experienced user
- * likely to take a novice a longer time to learn.

Graphical user interface

- Most communication is via elements such as windows, icons, menus, pointers, etc. (not just WIMP)
- * GUI system is usually easier to learn) Can gain 2 -different points
- GUI system is usually more intuitive) - if well argued
- GUI may use icons relevant to the application/be more transparent to the user
- may be similar to other packages with which users are familiar
- there is no need to remember complex text commands
- it is easier to cut and paste between applications
- users can customise desk-top, etc.
- usually good help / tutorial system available.

[Marking: a) not “user friendly” alone b) Can’t get both * points above)].

Speech recognition

- commands and/or text input are given to the computer via human speech
- speeds up text input / faster than typing
- can be used by someone doing another task with their hands e.g. pilot
- can be used by someone who is unable to type / not a skilled typist / disabled
- avoids RSI, etc.
- can involve very heavy hardware performance requirements (once only)
- difficulty picking up / separating speech sounds
- people have different accents/voices / computer may need to “learn” the speech style
- cannot usually be used without some tuition / may have to speak slowly
- affected by colds, throat infections, etc.
- problem of background noise/interference from/to other staff in office
- can overhear others' input
- can have difficulty with proper nouns
- can have difficulty with homophones e.g. to too two.

Speech synthesis

- useful for e.g. telephone banking
- useful for people with visual impairment
- can be annoying / obtrusive
- can be difficult to hear in noisy environment
- can involve very heavy hardware performance requirements (once only)
- may pronounce words incorrectly.

	<u>Handwriting recognition</u> <ul style="list-style-type: none">• data is entered by a stylus / pen on a pad• quicker / easier for user than typing• avoids bulky keyboard• may not be very accurate - could easily “misread” user's handwriting• difficult to use - needs constant visual checking• may not be possible for disabled users• user may need to learn writing style• computer may need to “learn” a writer's handwriting.		
--	---	--	--