



GCSE COMPUTER SCIENCE 8525/2

Paper 2 Computing concepts

Mark scheme

June 2025

Version: 1.0 Final



Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from aqa.org.uk

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The following annotation is used in the mark scheme:

- ;** - means a single mark
- //** - means alternative response
- /** - means an alternative word or sub-phrase
- A** - means acceptable creditworthy answer. Also used to denote a valid answer that goes beyond the expectations of the GCSE syllabus.
- R** - means reject answer as not creditworthy
- NE** - means not enough
- I** - means ignore
- DPT** - in some questions a specific error made by a candidate, if repeated, could result in the candidate failing to gain more than one mark. The DPT label indicates that this mistake should only result in a candidate losing one mark on the first occasion that the error is made. Provided that the answer remains understandable, subsequent marks should be awarded as if the error was not being repeated.

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Question	Part	Marking guidance	Total marks
01	1	Mark is for AO1 (recall) 8 // eight // 2^3 ;	1

Question	Part	Marking guidance	Total marks
01	2	Mark is for AO2 (apply) 8 // eight // 2^3 ;	1

Question	Part	Marking guidance	Total marks
01	3	Mark is for AO1 (recall) A Base 2; R. if more than one lozenge shaded	1

Question	Part	Marking guidance	Total marks
02	1	2 marks for AO2 (apply) 63;; If the answer given is not fully correct then award a maximum of 1 mark from the following: MP1: 3×16 // 48; MP2: converting F into 15 / using 15 in their calculation; MP3: converting the hex into binary (00)111111;	2

Question	Part	Marking guidance	Total marks
02	2	2 marks for AO2 (apply) 11001; 110; Note to examiners: if fewer than eight digits given, read from right to left.	2

Question	Part	Marking guidance	Total marks
03		2 marks for AO2 (apply) A 12 000 000 kB; F 1.5 GB;	2

Question	Part	Marking guidance	Total marks
04		2 marks for AO1 (recall) Software Programs / (set of) instructions / code (that runs on a computer/device); R. Digital component / applications / apps Hardware Physical/mechanical/electrical/electronic components/parts (that make up a computer/device);	2

Question	Part	Marking guidance	Total marks
05		2 marks for AO1 (recall) Maximum of 2 marks from the following: MP1: Memory/RAM management; MP2: (Input/output) device management; A. Peripheral management MP3: Applications management; MP4: Security management; MP5: File/storage management; MP6: Network management; MP7: User management; A. User interface A. Controls in place of manages R. Processor/process/task management	2

Question	Part	Marking guidance	Total marks																
06	1	2 marks for AO1 (understanding) 1 mark for any one row correct; 2 marks for all three rows correct; R. row if there is more than one tick on that row <table border="1"> <thead> <tr> <th>Statement</th><th>True for compiler only</th><th>True for assembler only</th><th>True for both compiler and assembler</th></tr> </thead> <tbody> <tr> <td>Converts program code into machine code</td><td></td><td></td><td>✓</td></tr> <tr> <td>Translates low-level languages into machine code</td><td></td><td>✓</td><td></td></tr> <tr> <td>Translates high-level languages into machine code</td><td>✓</td><td></td><td></td></tr> </tbody> </table>	Statement	True for compiler only	True for assembler only	True for both compiler and assembler	Converts program code into machine code			✓	Translates low-level languages into machine code		✓		Translates high-level languages into machine code	✓			2
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Translates high-level languages into machine code	✓																		

Question	Part	Marking guidance	Total marks
06	2	2 marks for AO1 (understanding) MP1: Assembly language uses numbers / symbols / abbreviations / mnemonics / is a symbolic representation of machine code // Machine code uses 1s and 0s A. bits/binary for 1s and 0s // Assembly language is easier to write/understand (A. easier to read/use) for humans (than machine code); MP2: Assembly language has to be translated into machine code (before it can be executed) // Machine code can be executed directly by the CPU (whereas assembly code cannot);	2

Question	Part	Marking guidance	Total marks
07	1	Mark is for AO1 (recall) C A list of characters mapped to a unique binary code; R. if more than one lozenge shaded	1

Question	Part	Marking guidance	Total marks
07	2	Mark is for AO2 (apply) 1100010; R. leading zeros	1

Question	Part	Marking guidance	Total marks
07	3	Mark is for AO2 (apply) (0) 1100100;	1

Question	Part	Marking guidance	Total marks
07	4	2 marks for AO1 (understanding) D Unicode uses fewer bits to represent each character than ASCII; E All of the ASCII codes are different to the Unicode codes; R. if more than two lozenges shaded	2

Question	Part	Marking guidance	Total marks
08	1	Mark is for AO1 (recall) (A pixel is a) single point (of colour) in an image // Smallest (addressable) part / point of an image; A. picture element A. alternatives to the word point eg dot, element R. square / block of colour	1

Question	Part	Marking guidance	Total marks
08	2	Mark is for AO2 (apply) 80 // eighty (pixels);	1

Question	Part	Marking guidance	Total marks
08	3	Mark is for AO2 (apply) 1 // one (bit);	1

Question	Part	Marking guidance	Total marks
08	4	Mark is for AO2 (apply) C Row 7; R. if more than one lozenge shaded	1

Question	Part	Marking guidance	Total marks
08	5	2 marks for AO2 (apply) 2000 (bits);; If the answer given is not fully correct then award a maximum of 1 mark from the following: MP1: Multiplying by 2 (bits) // stating a colour depth of 2 // 2bpp; MP2: Multiplying by 1000;	2

Question	Part	Marking guidance	Total marks
09	1	Mark is for AO1 (recall) The number of samples per second / minute / time period // The frequency that samples are taken (of a sound);	1

Question	Part	Marking guidance	Total marks
09	2	Mark is for AO1 (recall) (Sample resolution is the) number of bits per sample;	1

Question	Part	Marking guidance	Total marks
09	3	3 marks for AO2 (apply) 50 (kilobytes) ;;; If answer is not fully correct then award a maximum of 2 working marks as follows: MP1: Multiplying any of 10 000, 4, 10 (even if result is incorrect); MP2: Dividing a calculation by 8 (even if result is incorrect); MP3: Dividing a calculation by 1000 (even if result is incorrect);	3

Question	Part	Marking guidance	Total marks
10	1	Mark is for AO1 (recall) NOT // not (gate);	1

Question	Part	Marking guidance	Total marks
10	2	Mark is for AO2 (apply) C Change gate Y to an AND gate; R. if more than one lozenge shaded	1

Question	Part	Marking guidance	Total marks																																																															
10	3	4 marks for AO2 (apply) 1 mark for each correct column; <table><tr><th>A</th><th>B</th><th>C</th><th>F</th><th>G</th><th>H</th><th>Q</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td></tr></table> A. F / FALSE / False / Off instead of 0 A. T / TRUE / True / On instead of 1	A	B	C	F	G	H	Q	0	0	0	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0	1	1	1	0	1	1	0	0	0	0	1	0	0	0	1	1	1	1	0	1	0	0	0	0	1	1	0	1	1	0	1	1	1	1	1	0	1	1	4
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Question	Part	Marking guidance	Total marks
10	4	2 marks for AO2 (apply) Note to examiners: any alternative notations must be referred to a senior examiner. $\overline{A.B}$;; If equation is not correct then award a maximum of 1 mark from the following: MP1: Using the AND symbol . in between inputs A and B; MP2: Using the NOT symbol $\overline{\quad}$ above an input; I. Parentheses unless they change the order of precedence I. Case R. if words used (eg AND, NOT etc)	2

Question	Part	Marking guidance	Total marks
11	1	4 marks for AO1 (understanding) Maximum of 4 marks from: MP1: (Program) instructions are stored in main memory/RAM; MP2: Instructions are fetched (in turn) from main memory/RAM by the CPU; MP3: Data is stored in main memory; MP4: Data may be fetched from main memory/RAM (by the CPU if required when executing an instruction); MP5: Data (as a result of executing an instruction) may be written back to main memory/RAM; R. References to information in place of data	4

Question	Part	Marking guidance	Total marks
11	2	2 marks for AO1 (understanding) Maximum of 2 marks from: MP1: RAM is volatile (and secondary storage is not); MP2: RAM is faster (to read/write data) (than secondary storage); MP3: RAM is more expensive (per unit) (than secondary storage); MP4: RAM is (typically) smaller in capacity (than secondary storage); R. larger unless qualified to refer to capacity MP5: RAM is directly accessed by the CPU (and secondary storage is not); MP6: RAM holds data and instructions currently in use (and secondary storage does not); MP7: RAM is not portable (but secondary storage <u>can</u> be portable); R. 'is' in place of 'can' A. Converse statements of each mark point eg MP3: secondary storage is cheaper (per unit) (than main memory)	2

Question	Part	Marking guidance	Total marks
11	3	2 marks for AO1 (understanding) C Data can be read from and written to a desktop computer's RAM; E ROM stores start-up instructions for the desktop computer; R. if more than two lozenges shaded	2

Question	Part	Marking guidance	Total marks
12		4 marks for AO1 (understanding) Maximum of 4 marks from: MP1: (Users) can access files from anywhere / multiple devices (with an Internet connection); MP2: Files/data can be shared more easily with others; MP3: Storage capacity is higher // Easier to increase storage capacity; MP4: Cheaper (initial) cost for the user; MP5: Computer that has a lower storage specification can be purchased // can be used to free up space on your local device; MP6: Files can be collaborated on at the same time; MP7: The cloud provider makes backups of files/data (rather than the user); MP8: Users are not responsible for the maintenance of the hardware; R. Cheaper, larger unless qualified	4

Question	Part	Marking guidance	Total marks
13		2 marks for AO1 (understanding) Maximum of 2 marks from: MP1: Embedded systems are built-in to other devices/systems/machines; MP2: Embedded systems have a dedicated/specific/single purpose/function; A. Task MP3: Embedded systems (usually) have less memory; MP4: Embedded systems (usually) have less processing power; MP5: Embedded systems are (usually) cheaper; MP6: Embedded systems are (usually) physically smaller; MP7: Embedded systems (usually) have more ROM than RAM; MP8: Embedded systems (may) have no secondary storage; A. Converse statements of each mark point eg MP1: non-embedded systems are not built in to other devices/systems/machines	2

Question	Part	Marking guidance	Total marks															
14		9 marks for AO2 (apply) <table><tr><th>Level</th><th>Description</th><th>Mark Range</th></tr><tr><td>3</td><td> Answer demonstrates a thorough discussion with well-developed explanations of the issues/measures. A balanced answer addressing a range of ethical and/or legal issues and cyber security measures. The answer is logically structured and includes points that are clearly relevant to the question. </td><td>7–9</td></tr><tr><td>2</td><td> Answer demonstrates some detailed description(s) or partially developed explanations of the issues/measures. Answer addresses ethical and/or legal issues and/or cyber security measures. The answer is somewhat structured and includes points that are mainly relevant to the question. </td><td>4–6</td></tr><tr><td>1</td><td> Answer includes statements or brief description(s) of the issues/measures. Answer may be unbalanced, addressing either ethical and/or legal issue(s) or cyber security measures. The answer may be unstructured and may not all be relevant to the question. </td><td>1–3</td></tr><tr><td colspan="2">No creditworthy material</td><td>0</td></tr></table> Indicative content Issues for the company: • Trust. The customers will lose trust in the company for loss of personal data. The company may lose business. • Privacy. The loss of personal data would breach personal confidentiality. The company may be liable. • Disclosure. The company would need to be fully transparent on the extent of the data breach which may cause embarrassment. • Security. The company is legally responsible for the security on protection of the data that it holds. • Accountability. An investigation would need to be carried out to potentially establish blame for the security flaw. • Data protection. The company may face legal issues for the loss of personal data. GDPR. • Insurance claims. Customers may pursue insurance claims against the company due to loss of data and property. • Country borders. The (applicable) laws could potentially differ depending on where the company operates from.	Level	Description	Mark Range	3	Answer demonstrates a thorough discussion with well-developed explanations of the issues/measures. A balanced answer addressing a range of ethical and/or legal issues and cyber security measures. The answer is logically structured and includes points that are clearly relevant to the question.	7–9	2	Answer demonstrates some detailed description(s) or partially developed explanations of the issues/measures. Answer addresses ethical and/or legal issues and/or cyber security measures. The answer is somewhat structured and includes points that are mainly relevant to the question.	4–6	1	Answer includes statements or brief description(s) of the issues/measures. Answer may be unbalanced, addressing either ethical and/or legal issue(s) or cyber security measures. The answer may be unstructured and may not all be relevant to the question.	1–3	No creditworthy material		0	9
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No creditworthy material		0																

		Cyber security measures: • Biometrics. The company could install biometrics such as fingerprint scanners for an added layer of security. • Password strength. Company employees and/or customers could be encouraged to use stronger passwords eg letters and numbers. • Password frequency. Company employees and/or customers could be forced to more regularly change their passwords. • Anti-virus software. The company could install software to check for and/or prevent malware attacks. • Social engineering. The company could train staff in how to stop social engineering attacks. • 2FA. The company could employ 2-factor authentication as an added layer of security. • Encryption. Data held could be encrypted in case of such a data breach. • Check access rights. The company should check what levels of access employees have. • Backups. The company should increase the frequency of/start taking backups of data. • Penetration Testing. The company should use this to test the vulnerability of their systems and use the outcomes to put appropriate measures in place to improve their security.	
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Question	Part	Marking guidance	Total marks
15		2 marks for AO1 (understanding) MP1: When the person / team testing the system has no knowledge of the target system; MP2: Simulating hacking / an attack from outside the system // simulating an external / outside attack; R. malicious outsider / hacking without further explanation R. references to black box testing	2

Question	Part	Marking guidance	Total marks
16	1	Mark is for AO1 (understanding) Transferring files between two networked computers / over a network // Transferring files between a client / device and a server;	1

Question	Part	Marking guidance	Total marks
16	2	Mark is for AO1 (understanding) Maximum of 1 mark from: MP1: Transferring web pages (and their contents) (over the Internet) (between a client and a web server); MP2: To access/load web pages // To request / receive web pages; MP3: To post form results to servers; R. website in place of web page	1

Question	Part	Marking guidance	Total marks
17		2 marks for AO1 (understanding) Maximum of 2 marks from: MP1: (cyber attacker) sending (a series of) emails / SMS / direct messages (on social media); NE. message on its own MP2: the hacker hopes to get as many 'bites' / clicks / hits as possible // a user clicks on a hyperlink / replies to the email; MP3: the message is generic; MP4: a user believes the message looks / sounds trustworthy // someone is trying to trick the user / pose as a legitimate organisation; MP5: a user provides personal / sensitive / important information (such as credit card or login details) // the hacker tries to trick the user into providing personal / sensitive / important information (such as credit card or login details);	2

Question	Part	Marking guidance	Total marks
18	1	Mark is for AO2 (apply) Fingerprint/Touch ID // facial recognition/Face ID // retina/iris/eye scan; A. voiceprint R. biometric measures which are not relevant to mobile phones	1

Question	Part	Marking guidance	Total marks
18	2	Mark is for AO2 (apply) Maximum of 1 mark from: MP1: the device PIN/passcode can always be used to override the biometric details (which means someone else can access your phone); MP2: the device might not test for alertness if the owner is asleep; MP3: standard of biometric security varies between devices (which could give users false sense of security) // Identical twins might be able to fool facial identification systems; MP4: an injury might prevent the fingerprint / face / eye from being used; MP5: (some) biometric data can be cloned/copied; MP6: some people do not have fingerprints / eyes; MP7: facial recognition may not work if your appearance changes / if you're not positioned correctly; MP8: facial recognition may not work in the dark; A. facial recognition can be spoofed on older devices A. Any reasonable weakness provided it is relevant to the stated security measure R. If weakness given is not relevant to the security measure stated in Q18.1	1

Question	Part	Marking guidance	Total marks
19	1	3 marks for AO1 (understanding) Maximum of 3 marks from: MP1: more susceptible to interference // signal/connection may be affected by thick walls/plaster/windows/appliances; MP2: limited range; MP3: the speeds are (usually) lower; MP4: wireless connections drop more frequently; MP5: easier to hack / less secure // wireless signal can be easily intercepted (compared to a wired signal); MP6: (Typically) lower bandwidth MP7: (Typically) higher latency / delay A. Some devices may not be as backwardly compatible (eg IoT devices on legacy 2.4 GHz) R. References to cost	3

Question	Part	Marking guidance	Total marks
19	2	2 marks for AO1 (understanding) Maximum of 2 marks from: MP1: more reliable over long distances // can transmit data over longer distances; MP2: faster (data) transfer (especially over long distances); MP3: higher bandwidth; MP4: more (data) secure // less likely for the signal to be intercepted; MP5: resistant to electrical interference;	2

Question	Part	Marking guidance	Total marks
20	1	2 marks for AO1 (recall) A database with multiple tables; that are linked together; R. database in place of table	2

Question	Part	Marking guidance	Total marks
20	2	2 marks for AO1 (recall) A field in one table; that is a primary key in another table; // A primary key in one table; whose values are used in a field in another table; R. database in place of table	2

Question	Part	Marking guidance	Total marks
20	3	Mark is for AO2 (apply) TestResultID; I. Case / spacing	1

Question	Part	Marking guidance	Total marks
20	4	6 marks for AO3 (program) Maximum of 5 marks if any errors. Mark A: for including only the three correct fields in SELECT clause; Mark B: one correct table in FROM clause; Mark C: second correct table in FROM clause // correct usage of ON with INNER JOIN; A. INNERJOIN or just JOIN R. if the FROM clause is not fully correct Mark D: one correct condition in WHERE clause; Mark E: all correct conditions and correct usage of AND in WHERE clause; Mark F: correct ORDER BY clause and no other ORDER BY clauses; DPT use of incorrect key words when their versions are meaningful in the context of the question, eg GET instead of SELECT or use of AND instead of commas in FROM clause DPT incorrect spelling of field names DPT consistent use of extraneous characters within the code, eg colons after keywords DPT field name before table name DPT == in place of = DPT incorrect use of square brackets and parentheses A. Table names in front of field names provided the table names are correct A. Single or double quotes around Biology I. correctly formatted brackets around field names and table names only eg [Student].[FirstName] or (FirstName),(LastName),(Score) I. Quotes around "1" as a value for the GCSEYear in WHERE clause I. Case, spacing, minor spelling errors except for SQL keywords Sample answer: <pre>SELECT FirstName, LastName, Score FROM Student, TestResult WHERE Student.StudentID = TestResult.StudentID AND GCSEYear = 1 AND Subject = 'Biology' ORDER BY Score DESC</pre> Alternative answer: <pre>SELECT FirstName, LastName, Score FROM Student INNER JOIN TestResult ON Student.StudentID = TestResult.StudentID WHERE Subject = 'Biology' AND GCSEYear = 1 ORDER BY Score DESC</pre>	6

Question	Part	Marking guidance	Total marks				
20	5	2 marks for AO3 (program) 1 mark for each correct response for A and B ; <table><tr><td>A</td><td>UPDATE</td></tr><tr><td>B</td><td>Score = 28</td></tr></table> A. quotes around 28 I. Case / spacing R. If any spelling mistakes	A	UPDATE	B	Score = 28	2
A	UPDATE						
B	Score = 28						