



GCSE MARKING SCHEME

SUMMER 2025

**COMPUTER SCIENCE - COMPONENT 1
C500U10-1**

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.

**WJEC GCSE COMPUTER SCIENCE
EDUQAS GCSE COMPUTER SCIENCE**

COMPONENT 1: UNDERSTANDING COMPUTER SCIENCE

SUMMER 2025 MARK SCHEME

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.

Q	Answer	Marks	AO1	AO2	AO3	Total
1.(a)	Award one mark for each of the following:	1	1			1
(i)	Decodes the program instruction in the CIR, selecting machine resources and a particular arithmetic operation, and coordinates activation of those resources.					
(ii)	Award one mark for each of the following: Keeps track of the memory address of which instruction is to be executed next	1	1			1
(iii)	Award one mark for each of the following: Temporarily stores intermediate results during arithmetic and logic operations.	1	1			1
1.(b)	Award one mark for each of the following, up to a maximum of two marks:	2	2			4
(i)	- A larger cache size allows the CPU to store more frequently accessed data, reducing the need to fetch information from slower main memory. - Thereby enhancing processing speed and efficiency - A larger cache size enables the CPU to handle a greater volume of data more quickly. - Particularly for tasks involving repetitive or sequential access to information. Award one mark for each of the following, up to a maximum of two marks: - A higher clock speed means the CPU can execute instructions at a faster rate, - Leading to quicker processing of tasks and improved overall system responsiveness - A higher clock speed enables the CPU to perform more instructions per second, - Enhancing its processing capabilities and supporting faster execution of computational tasks.	2	2			
(ii)	Award one mark for each of the following: - Increasing cache size takes up more physical space on the CPU chip, which can lead to higher manufacturing costs / potentially larger chip sizes - Higher clock speeds result in increased power consumption and heat generation	2	2			2

Q	Answer	Marks	AO1	AO2	AO3	Total																								
2.(a)	Award one mark for each of the following:	3	3			3																								
	<table><tr><th rowspan="2">Characteristic</th><th colspan="4">Primary storage</th></tr><tr><th>ROM</th><th>Flash</th><th>RAM</th><th>Virtual</th></tr><tr><td>Retains data when power is turned off, commonly used in memory cards and solid-state drives.</td><td></td><td>✓</td><td></td><td></td></tr><tr><td>A non-volatile memory type which stores programs that do not change.</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>An extension of a computer's physical memory achieved by simulating additional memory space by using other storage.</td><td></td><td></td><td></td><td>✓</td></tr></table>						Characteristic	Primary storage				ROM	Flash	RAM	Virtual	Retains data when power is turned off, commonly used in memory cards and solid-state drives.		✓			A non-volatile memory type which stores programs that do not change.	✓				An extension of a computer's physical memory achieved by simulating additional memory space by using other storage.				✓
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An extension of a computer's physical memory achieved by simulating additional memory space by using other storage.				✓																										
2.(b)	Award one mark for each correct column for the following: • Correct durability order • Correct speed order • Correct cost order	3	3			3																								
	<table><tr><th>Media</th><th>Durability</th><th>Speed</th><th>Cost per unit of storage</th></tr><tr><td>Blu-ray disc</td><td>3</td><td>2</td><td>4</td></tr><tr><td>Magnetic tape</td><td>2</td><td>1</td><td>1</td></tr><tr><td>Flash drive</td><td>4</td><td>4</td><td>3</td></tr><tr><td>Hard disk drive</td><td>1</td><td>3</td><td>2</td></tr></table>						Media	Durability	Speed	Cost per unit of storage	Blu-ray disc	3	2	4	Magnetic tape	2	1	1	Flash drive	4	4	3	Hard disk drive	1	3	2				
	Media						Durability	Speed	Cost per unit of storage																					
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Q	Answer	Marks	AO1	AO2	AO3	Total																									
3.(a)	Award one mark for each missing item: <table><tr><td></td><td></td><td></td><td></td><td>$\overline{A} + B$</td></tr><tr><td></td><td>0</td><td></td><td></td><td></td></tr><tr><td>0</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>0</td><td></td></tr><tr><td></td><td></td><td>0</td><td></td><td></td></tr></table> Accept any correct alternatives, for example: $(\overline{A} \oplus B) + B$					$\overline{A} + B$		0				0								0				0			5		5		5
				$\overline{A} + B$																											
	0																														
0																															
			0																												
		0																													
3.(b)	Award one mark for each simplification, up to a maximum of five marks: $Y.X + Y.\overline{Y} + X.X + X.\overline{Y}$ $Y.X + 0 + X + X.\overline{Y}$ $Y.X + X + X.\overline{Y}$ $X.(Y + 1 + \overline{Y})$ $X.(1)$ Award six marks for the following X	5 <																													

Q	Answer	Marks	AO1	AO2	AO3	Total
4.(a)	Award one mark for each of the following: - A router stores the addresses of computers on the network and transfers data between devices/networks. - A hub copies all packets of data to all devices on the network. - A switch analyses each packet of data and sends it to the device it was intended for.	3	3			3
4.(b)	Award one mark for each of the following, up to a maximum of four marks: - The OSI model is a conceptual framework that is designed to facilitate standardisation in network communication - It comprises seven layers: - Physical Layer (Layer 1): Deals with the physical connection between devices, including transmission and reception of raw data bits over a physical medium - Data Link Layer (Layer 2): Ensures reliable communication over the physical layer, addressing issues like framing, error detection and flow control - Network Layer (Layer 3): Manages logical addressing, routing, and forwarding of data between different networks, enabling devices on different networks to communicate - Transport Layer (Layer 4): Provides end-to-end communication services for data segmentation, error correction, and flow control, ensuring reliable data transfer between devices - Session Layer (Layer 5): Establishes, manages, and terminates communication sessions, allowing for the synchronisation and organisation of data exchange between applications. - Presentation Layer (Layer 6): Deals with the translation, encryption, and compression of data, ensuring that data is presented in a readable format for the application layer - Application Layer (Layer 7): Serves as the interface between the user and the network, providing network services directly to end-users and applications. - Each layer handles specific tasks in the communication process - It allows for a modular and flexible design, as each layer addresses distinct functions - It serves as a reference model for understanding and developing common protocols and standards.	4	4			4

Q	Answer	Marks	AO1	AO2	AO3	Total
5.(a)	Award one mark for identification and one mark for description for each component. - Protocol / scheme / https:// - Indicates the protocol used for accessing the resource/ secure variant of HTTP. - Domain / subdomain / www.eduqas.co.uk - Specifies the location of the resource on the internet - Top Level domain .co.uk - Specifies the location of the domain on the internet - Path / sub directory/ sub folder /computer-science-gcse/ - Describes the specific resource or location on the server, forming the remainder of the URL after the domain - Anchor / #tab_pastpapers - Specifies a specific section within the resource, allowing direct navigation to a particular part of the page.	4		4		4
5.(b)	Award one mark for each of the following: 2nd: G 3rd: B 4th: D 5th: F 6th: A 7th: E	6		6		6
6.(a) (i)	Award one mark for the following: 0	1		1		1
(ii)	Award one mark for each of the following: 1111₂ 15₁₀	2		2		2
6.(b)	Award one mark for each of the following: 11110001₂ - Correct carry bits <pre> 0 1 1 0 1 0 1 0 + 1 0 0 0 0 1 1 1 ----- 1 1 1 1 0 0 0 1 ----- 1 1 1 </pre>	2		2		2
6.(c)	Award one mark for each of the following: 0000₂ - Underflow - Number too small to be stored	3		3		3

Q	Answer	Marks	AO1	AO2	AO3	Total
7.(a)	Award one mark for the following: Standardised character set / ASCII.	1		1		1
7.(b)	Award one mark for each of the following: - Standardised character set that assigns a unique code / binary number to every character - It enables consistent representation and communication of text across different devices and systems	2	2			2
7.(c)	Award one mark for the following: - Unicode Award one mark for each of the following, up to a maximum of two marks: - It offers a comprehensive and standardised encoding for characters from diverse languages, scripts, and symbols - Ability to represent almost all world languages - Ensures seamless multilingual support - Eliminates the need for multiple character sets - Simplifies internationalisation efforts - Fosters compatibility between different systems.	1 2	1 2			3
8.(a)	Award one mark for the following:	1	1			1
(i)	MULTI-TASKING					
(ii)	Award one mark for the following: INTERRUPT	1	1			1
(iii)	Award one mark for the following: BACKING STORE	1	1			1
(iv)	Award one mark for the following: MEMORY	1	1			1
8.(b)	Award one mark for each of the following, up to a maximum of two marks:	2	2			2
(i)	- Disk partition editors allow users to create, modify, resize, and manage the partitions on a hard disk - Create new partitions or delete existing ones to organise storage space - Modify the size of existing partitions or merge multiple partitions into one - Prepare partitions for data storage by formatting them with a specific file system - Some advanced partition editors offer features for data recovery and repair.					

Q	Answer	Marks	AO1	AO2	AO3	Total
(ii)	Award one mark for each of the following, up to a maximum of two marks: • Revision control tracks changes to files over time • It records changes made to files, including additions, deletions, and modifications • It enables the creation of branches for parallel development and later merging of changes back into the main version • It facilitates collaboration among multiple contributors by providing a centralised repository for managing changes • Helps resolve conflicts that may arise when multiple users make changes to the same file simultaneously • Allows users to revert files or projects to previous states, undoing undesirable changes.	2	2			2
9.	Indicative content Presence check (has a title been entered) 1 if FirstName = "" then 2 output "Please enter a First Name" 3 end if Lookup check (Mr, Miss, Mrs, Ms, Mx, Dr etc.) 1 if title <> ("Mr" OR "Mrs" OR "Miss" OR "Mx" OR "Dr") then 2 output "Invalid title chosen" 3 end if Length check (9 characters) 1 if len(PassportNo) <> 9 then 2 output "Passport Numbers must be 9-digits long" 3 end if Range check (Day 1-31) 1 if Day < 1 OR Day > 31 then 2 output "Please check the DOB entered" 3 end if Type check (integers) 1 if PassportNo <> int(PassportNo) then 2 output "Passport Number must only include digits" 3 end if Award one mark for each of the following, in each validation check, up to a maximum of five checks: • Suitable validation check • Suitable output message	5 5			5 5	10

Q	Answer	Marks	AO1	AO2	AO3	Total																								
10. (a)	Award one mark for each of the following: <table><tr><th rowspan="2">Description</th><th colspan="4">Translator</th></tr><tr><th>Assembler</th><th>Compiler</th><th>Interpreter</th><th>Loader</th></tr><tr><td>Translates entire high-level code into machine code in a single process</td><td></td><td>✓</td><td></td><td></td></tr><tr><td>Translates low-level code into machine code</td><td>✓</td><td></td><td></td><td></td></tr><tr><td>Translates high-level code line by line during runtime</td><td></td><td></td><td>✓</td><td></td></tr></table>	Description	Translator				Assembler	Compiler	Interpreter	Loader	Translates entire high-level code into machine code in a single process		✓			Translates low-level code into machine code	✓				Translates high-level code line by line during runtime			✓		3	3			3
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10. (b) (i)	Award one mark for each of the following, up to a maximum of two marks: • Comments and unneeded spaces are removed • Keywords, constants and identifiers are replaced by 'tokens' • A symbol table is created which holds the addresses of variables, labels and subroutines.	2	2			2																								
(ii)	Award one mark for each of the following, up to a maximum of two marks: • Variables are checked to ensure they have been properly declared and used • Variables are checked to ensure they are of the correct data type, e.g. real values are not being assigned to integers • Operations are checked to ensure they are legal for the type of variable being used, e.g. you would not try to store the result of a division operation as an integer.	2	2			2																								

Q	Answer	Marks	AO1	AO2	AO3	Total
11.	Award one mark for naming each Act, up to a maximum of two marks: • The General Data Protection Regulation (GDPR) / Data Protection Act 2018 • Computer Misuse Act 1990 • Copyright Designs and Patents Act 1988 • Creative Commons Licensing • Regulation of Investigatory Powers Act 2000 • Telecommunications Regulations Act 2000 • Freedom of Information Act 2000. Award one mark for describing each impact, up to a maximum of four marks: General Data Protection Regulation (GDPR) / Data Protection Act 2018 • Imposes strict rules on the processing and handling of personal data • Requires organisations to obtain consent for data processing • Gives individuals greater control over their personal data • Requires data breach notifications and imposes significant fines for non-compliance. Computer Misuse Act 1990: • Criminalises unauthorised access to computer systems • Prohibits unauthorised modification of computer material • Addresses offenses related to the creation and distribution of malicious software • Establishes penalties for unauthorised computer activities, including hacking and cyberattacks. Copyright Designs and Patents Act 1988: • Protects intellectual property rights in software, databases, and other digital content • Regulates the copying, distribution, and public performance of copyrighted material • Provides legal remedies for copyright infringement, including damages and injunctions. Creative Commons Licensing: • Offers a flexible framework for copyright licensing • Allows content creators to specify the permissions for the use of their work • Facilitates the sharing and distribution of creative works with predefined licensing terms.	6	6			6

Q	Answer	Marks	AO1	AO2	AO3	Total
	Regulation of Investigatory Powers Act 2000: • Grants legal powers to law enforcement agencies for electronic surveillance • Regulates the interception of communications and access to encrypted data • Establishes safeguards to protect individual privacy rights. Telecommunications Regulations Act 2000: • Addresses the regulation of the telecommunications industry • Governs issues such as licensing, competition, and consumer protection in the telecommunications sector. Freedom of Information Act 2000: • Promotes transparency and accountability in public authorities • Allows individuals to request information held by public bodies • Defines procedures and exemptions to balance transparency with the need for confidentiality.					

Q	Answer	Marks	AO1	AO2	AO3	Total
12. (a)	Award up to three marks for each of the following, up to a maximum of six marks: • Malware ○ Malicious software designed to harm or exploit computer systems. ○ Includes viruses, worms, trojan horses, ransomware, and spyware. ○ Typically spread through infected files, emails, or websites. • Phishing ○ Deceptive attempts to acquire sensitive information by posing as a trustworthy entity. ○ Often involves fraudulent emails, websites, or messages to trick users into revealing passwords or financial details. • Social Engineering ○ Manipulating individuals to disclose confidential information or perform actions against their best interests. ○ Relies on psychological manipulation, trust-building, or exploiting human tendencies. • Brute Force Attacks ○ Trying all possible combinations of passwords or encryption keys to gain unauthorised access. ○ Requires significant computing power and time, but can be effective if passwords are weak. • Denial of Service Attacks ○ Overloading a system, network, or service to make it temporarily or indefinitely unavailable. ○ Can be achieved through flooding the target with traffic, exploiting vulnerabilities, or disrupting resources. • Data Interception and Theft ○ Unauthorised access or capture of sensitive information during transmission. ○ May involve eavesdropping on communication channels, intercepting data packets, or exploiting vulnerabilities in networks. • SQL Injection ○ Exploiting vulnerabilities in a website or application by injecting malicious SQL code. ○ Can lead to unauthorised access, data manipulation, or exposure of sensitive information in a database.	6	6			6

Q	Answer	Marks	AO1	AO2	AO3	Total
12. (b)	Award up to three marks for each of the following, up to a maximum of six marks: • Penetration Testing ○ Simulates real-world cyberattacks to identify vulnerabilities in a system ○ Conducted by ethical hackers to assess the security of networks, applications, and infrastructure ○ Aims to discover weaknesses before malicious actors can exploit them. • Network Forensics ○ Involves the analysis of network traffic and data to investigate security incidents ○ Helps identify the source and impact of security breaches ○ Provides insights into the sequence of events during a cyber incident. • Anti-Malware Software ○ Detects, prevents, and removes malware from computer systems ○ Includes antivirus programs, anti-spyware tools, and other security solutions ○ Regularly updates malware definitions to stay effective against evolving threats. • Firewalls ○ Acts as a barrier between a private internal network and external networks (e.g., the internet) ○ Monitors incoming and outgoing network traffic based on predetermined security rules ○ Protects against unauthorised access and cyber threats. • User Access Levels ○ Defines the permissions and privileges granted to users based on their roles ○ Limits access to sensitive information and critical system functionalities ○ Reduces the risk of unauthorised actions and data breaches. • Passwords ○ Authentication mechanism requiring users to prove their identity ○ Typically a combination of characters, numbers, and symbols ○ Should be complex, regularly updated, and not easily guessable.	6				6
		6				

Q	Answer	Marks	AO1	AO2	AO3	Total
	• Double Authentication ○ Requires users to provide two or more forms of identification before accessing a system. ○ Commonly involves a combination of passwords, PINs, smart cards or biometrics. ○ Enhances security by adding an extra layer of protection against unauthorised access. • Encryption ○ Converts readable data into a coded format to prevent unauthorised access. ○ Utilises algorithms to encode information, making it unreadable without the decryption key. ○ Applied to data in transit (e.g. during communication) and data at rest (e.g. stored files).					
TOTAL		100	60	30	10	100