CAMBRIDGE
International Education

Cambridge International AS & A Level

COMPUTER SCIENCE **9618/12**

Paper 1 Theory Fundamentals **October/November 2025**

MARK SCHEME

Maximum Mark: 75

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	Correct
	Incorrect
	To indicate where a key word/phrase/code is missing.
	Not relevant or used to separate parts of an answer.
	Indicates a part of the answer that is incorrect.
Highlighter	To draw attention to a particular aspect or to indicate where parts of an answer have been combined.
TV	Too vague.
REP	Repetition
NE	No examples or not enough.
BOD	Benefit of Doubt.
NAQ	Not Answered Question.
SEEN	Indicates that work or a page has been seen including blank answer spaces and blank pages.
FT	Follow through.
I	Ignore

Question	Answer	Marks
1	**1 mark** for 2 or 3 correctly connected verification method boxes, **2 marks** for all 4 correct **Verification Method** **Use** Parity byte check Checksum Visual check Parity block check Data transfer Data entry	**2**

Question	Answer	Marks
2(a)	**1 mark** for each correct row, **max 4** marks	**4**

Term	Description
Copyright	Gives the holder the legal right of ownership of intellectual property
Open Source (Initiative)	Software can be freely copied, distributed or adapted
Shareware	Gives the user a trial period / limited functionality before a payment/sign up may be required
Software Licence	A (legal) agreement that defines the rights and terms of usage for the software

Question	Answer	Marks
2(b)	**1 mark** per bullet point, **max 2** marks **e.g.** • to create a safe, respectable and professional working environment for all employees • to ensure that employees understand the expectations • ... and the consequences of their actions • to provide a clear outline of what is considered good practice • so there are clear rules to follow in certain situations • to protect the reputation of the organisation // maintain public trust	**2**

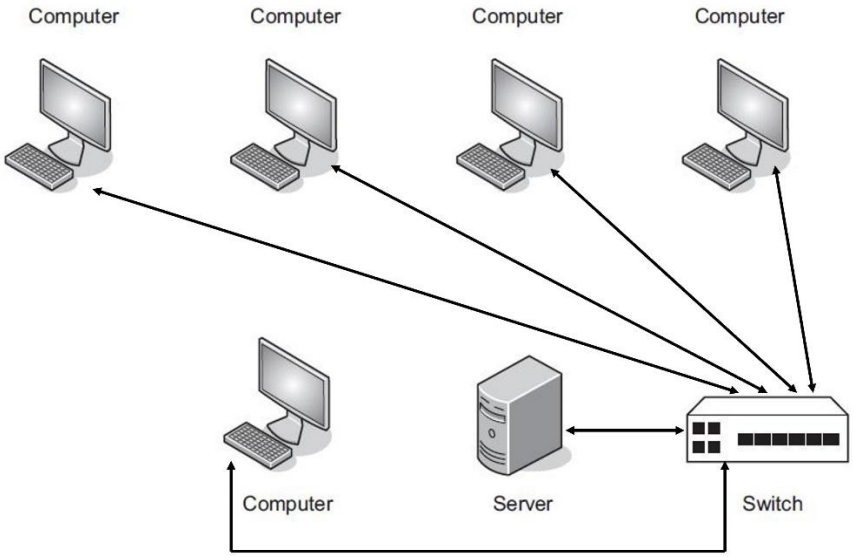
Question	Answer	Marks
3(a)(i)	**1 mark** • The value of the operand is an offset value which is added to another base value to give the address from which the contents are loaded to the accumulator	**1**
3(a)(ii)	**1 mark** per bullet point, **max 2** marks • Program counter (PC) • Memory Data Register (MDR) • Memory Address Register (MAR) • Current Instruction Register (CIR) • Status Register	**2**
3(b)	**1 mark** for each correct value, **max 3** marks **Instruction** / **Value in ACC** `LDM #98` / 98 `LDI 101` / 8 `LDX 100` / 32	**3**
3(c)	**1 mark** per bullet point, **max 2** marks for each Clock Speed: • Processor can perform more F-E cycles per second • ... so more instructions / data can be processed each second Cache Memory: • Can store more of the most frequently used instructions • … which reduces the need to access slower RAM	**4**

Question	Answer	Marks
4(a)	**1 mark** per bullet point, **max 2** marks • The relationship between SHIP and CONTAINER is one-to-many (1:M) • The primary key ShipID in the SHIP table is linked to the foreign key ShipID in the CONTAINER table	**2**

4(b)	**1 mark** per bullet point, **max 2** marks
	
	• ALTER TABLE statement
	• Including the additional field with a suitable field name and suitable field type
	
	Example answer
	`ALTER TABLE CONTAINER`
	`ADD InspectionDate DATE;`
		2

4(c)	**1 mark** per bullet point, **max 4** marks
	
	• SELECT COUNT statement
	• Using the correct tables
	• Joining the tables
	• The condition for the name
	
	Example Answer 1:
	
	`SELECT COUNT(ContainerID)`
	`FROM CONTAINER, SHIP`
	`WHERE CONTAINER.ShipID = SHIP.ShipID`
	`AND ShipName = "Caledonia";`
	
	Example Answer 2:
	
	`SELECT COUNT(ContainerID)`
	`FROM CONTAINER INNER JOIN SHIP`
	`ON CONTAINER.ShipID = SHIP.ShipID`
	`WHERE ShipName = "Caledonia";`
		4

4(d)	**1 mark** per bullet point, **max 2** marks • To allow the user to create / modify / delete tables // maintain the database • To allow the user to set up / modify relationships • To allow the user to create a form for data input • To allow a user to add tools to a form // for example, drop-down boxes / buttons etc. • To allow a user to design a report (to show the output in an organised manner) • To allow a user to add a menu to enable a choice of different actions • To allow a user to inspect the database contents and metadata • ... by creating and/or running different SQL queries	**2**

Question	Answer	Marks
5(a)	**1 mark** per bullet point, **max 2** marks • Covers a small geographical area • Normally privately owned / dedicated infrastructure • Can use wired or wireless communication	**2**
5(b)	**1 mark** per bullet point, **max 2** marks • All computers directly connected to switch and no other connections • Switch connected directly to server  	**2**
5(c)	**1 mark** per bullet point, **max 3** marks • The sending device sends the packets to the switch • The switch checks the destination address on each packet • … and sends them **only** to the intended receiver	**3**
5(d)	**1 mark** per bullet point, **max 3** marks • The use of CSMA/CD // Carrier Sense Multiple Access with Collision Detection • The workstations listen to the communication channel • ... and send data only when there is no data being transmitted / the line is idle • If a collision is detected, transmission is aborted • …and a jamming signal is sent • The workstation calculates a random wait time before trying to re-transmit • The random time is increased if there are multiple collisions	**3**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(e)</td><td>1 mark for correct threat
1 mark corresponding description
1 mark for correct method of prevention

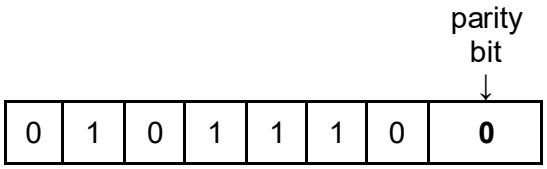
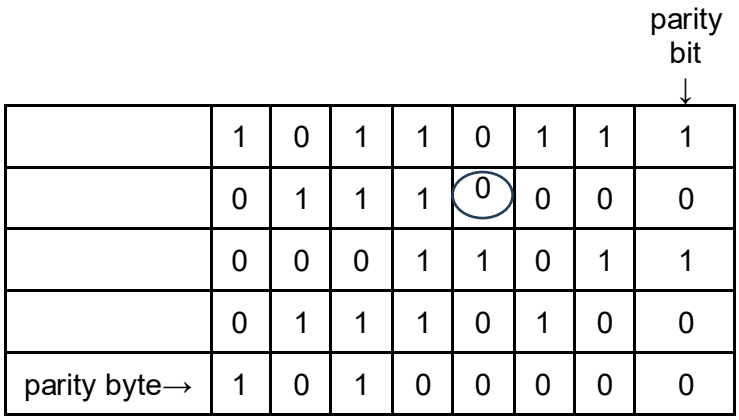
<table>
<tr><th>Threat</th><th>Description</th><th>Prevention</th></tr>
<tr><td>Malware / Virus</td><td>Malicious code that can alter/delete files</td><td>Anti-virus // Anti-malware // Firewall</td></tr>
<tr><td>Spyware</td><td>Records keystrokes which are sent to third party</td><td>Anti-spyware // Firewall // Anti-malware</td></tr>
<tr><td>Hacking</td><td>Gaining unauthorised access to a computer network / device</td><td>Authentication // Firewall</td></tr>
<tr><td>Phishing</td><td>Emails supposedly from reputable companies are sent to trick people into revealing personal information</td><td>Use a spam filter // Do not open emails from unknown sources</td></tr>
<tr><td>Pharming</td><td>Users are directed to a bogus website that looks legitimate to obtain personal information</td><td>Use a VPN // Anti-malware// Do not open links or download attachments</td></tr>
</table></td><td>3</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)</td><td>1 mark for correct answer

Type of compression: lossy
Justification: There will be fewer samples per second, so data will be permanently lost

// There will be fewer samples per second, so the original sound cannot be re-created</td><td>1</td></tr>
<tr><td>6(b)</td><td>1 mark for correct words in the correct order

<table>
<tr><td>Binary Value</td><td>0011 1000</td><td>0011 1100</td><td>0011 1110</td></tr>
<tr><td>Word</td><td>Science</td><td>is</td><td>Amazing!</td></tr>
</table></td><td>1</td></tr>
</table>

Question	Answer	Marks
6(c)(i)	**1 mark** for correct answer 	**1**
6(c)(ii)	**1 mark** for correct answer  [1]	**1**
6(d)	**1 mark** for the working **1 mark** for the correct answer Working: (1000 * 2000 * 16) / (8 * 1000 * 1000) // (1000 * 2000 * 2 / (1000 * 1000) Answer: 4 megabytes	**2**

Question	Answer	Marks
7(a)	**1 mark** for the correct answer 1100 0000	**1**
7(b)	**1 mark** for the correct answer 8 // 16 // 32 // 64	**1**
7(c)(i)	**1 mark** for the correct answer 0001 0000 0100	**1**
7(c)(ii)	**1 mark** for the correct answer 68	**1**

Question	Answer	Marks
8(a)(i)	**1 mark** per bullet point, **max 2** marks • Cloud storage can be free of charge for a limited amount • There is no need for personal storage devices • The data can be accessed from any computer **with an internet connection** • Cloud data services usually include data backup and recovery services • It is easier to share data / collaborate with colleagues • Cloud storage capacity can be quickly and easily increased if needed	**2**
8(a)(ii)	**1 mark** per bullet point, **max 2** marks • The storage/cloud can only be accessed with an internet connection • There may be no backups // possibly no control over backups // reliance on third party for backups • Uploading / downloading data could take a long time • Potential issues with the cloud storage company impacting access e.g. downtime or technical problems • Potential compatibility issues if wanting to move the data • Limited storage availability without paying extra • … meaning (possibly) more expensive in the long term • Possibly security issues	**2**
8(b)(i)	**1 mark** per bullet point, **max 4** marks Methods to determine point of touch (**Max 2)** • Resistive // two layers of material make contact and complete a circuit • Capacitive // contact with the screen creates a change in charge • Infrared // the beams are broken by the pointing device • Optical imaging // a shadow is created when the surface is touched • Acoustic pulse // the acoustic wave is absorbed by the pointing device • Selection from the menu (**Max 2**) • The point of touch is used to determine the x and y coordinates • The menu item corresponding to the coordinate position is recognised and the menu item is added to the order	**4**
8(b)(ii)	**1 mark** per bullet point, **max 2** marks • Disk repair / disk contents analysis • Back-up software	**2**

Question	Answer	Marks
9(a)	**1 mark** per bullet point, **max 2** marks • NOT (**A** XOR **B**) • NAND ((**B** AND **C**) OR **A**) **X** = (NOT (**A** XOR **B**)) NAND ((**B** AND **C**) OR **A**) // **X** = ((**B** AND **C**) OR **A**) NAND (NOT (**A** XOR **B**))	**2**

Question	Answer	Marks
9(b)	**1 mark** for 1 or 2 row numbers correct, **2 marks** all three correct Row 2 Row 4 Row 7	**2**

Question	Answer	Marks
10(a)	**1 mark** per bullet point, **max 4** marks **Max 2** from each section. Interpreter: • Use an interpreter while writing/coding the program • … to test / debug the partially completed program • … because errors can be corrected and processing continue from where the execution stopped // errors can be corrected in real time // errors are identified one at a time Compiler: • Use the compiler after the program is complete • … to create an executable file so source code not seen • Use the compiler to repeatedly test the same completed section without having to re-interpret every time	**4**
10(b)	**1 mark** per bullet point, **max 2** • The software is free of restrictions • The software is not necessarily free of charge • The source code comes with the program // A user can edit the source code to add functionality / suit their needs • Users can share the software with others	**2**
10(c)	**1 mark** for a correct answer • Digital Signature	**1**

Question	Answer	Marks
11	**1 mark** per bullet point, **max 3** marks Identification: Control system (no mark) Justification: • The system uses an actuator to open or close the doors • The output / opening the doors allows people to move, which changes the input to the sensor • The system acts autonomously on the feedback from a sensor	**3**

