CAMBRIDGE
International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/13**

Paper 1 Theory **May/June 2025**

MARK SCHEME

Maximum Mark: 70

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 May/June 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
	Benefit of the doubt
	To indicate where a key word/phrase is missing
	Incorrect
	Indicate a point in an answer
	Ignore subsequent work
	Statement/points are linked
	Maximum number of marks that can be awarded
	Not answered question
Off-page comment	Allows comments to be entered at the bottom of the RM marking window and then displayed when the associated question item is navigated to.
	To indicate a point that has already been made or was given in the question
	Indicates that work/page has been seen including blank answer spaces and blank pages.
	Correct
	Too vague
	Indicate a point in an answer

Question	Answer	Marks
1	**Max 2 for each method (max two methods):** **Descriptions must match the method.** • Questionnaire (1st) – A **remote** method of gathering data (1) – Is a **fixed** set of questions that cannot be changed (1) – Completed in respondent's own time/location (1) – Can be **online** or **printed on paper//in physical form** (1) • Interviews (1st) – **The interviewer(s)** asks the questions//questions are asked **face to face** (1) – Answers are gathered in real time (1) – In structured interviews the questions are asked in the same order for each interviewee and with a choice of answers (1) – Unstructured interviews can be different for each interviewee//interviewees can expand on their answers/usually no pre-set list of answers (1) – Interviewer can ask follow-up questions (1) • Data logging (1st) – Uses sensors to collect data (1) – Can be used to collect data over a period of time (1) – Either continuously or at set/regular intervals. (1) • Document analysis (1st) – Examining existing documents (1) to create new information (1)	**4**

Question	Answer	Marks
2	**One mark per bullet point to a maximum of five marks.** • SSL stands for **Secure Socket Layer** and TLS stands for **Transport Layer Security** (1) • They provide network security (1) • TLS/SSL are used in web browsing/email/Internet faxing/instant Messaging/Voice over IP/VoIP (must have at least two examples) (1) • Client-server applications use TLS in a network to try to prevent Eavesdropping (1) • Encrypts data sent from users to website//data sent from websites to users (1) • Certificates are sent (1) and confirmed with a **trusted** authority (1) • They enable credit card/online payments to be made securely (1) • SSL/TLS requires a handshake to be carried out. (1) • SSL/TLS is used by the presentation layer//SSL/TLS operate/work between the application layer and the transport layer (1)	**5**

Question	Answer	Marks
3	**One mark per bullet point to a maximum of six marks.** • Inference engine compares inputs with rules in the knowledge base (1) • Uses IF …..THEN reasoning (1) **Forward chaining** • The reasoning uses **forward chaining** (1) • Forward chaining starts with the available data (1st) – And uses inference **rules** to extract more data//ask more questions (1) – Until a goal is reached//Until it finds one where the IF statement is **known to be true** (1) – The THEN part **adds new information** (1) • Forward chaining can be called data-driven (1) **Backward chaining** • The reasoning uses **backward chaining** (1) • Backward chaining starts with a list of goals/hypotheses (1) • Backward chaining would search the inference rules (1st) – Until it finds one which has a THEN part **that matches a desired goal** (1) • If the IF part of that rule is not known to be true (1st) – The THEN part adds this to the list of goals (1) • Backward chaining can be called goal-driven (1)	**6**

Question	Answer	Marks
4	**Three marks from:** • A computer program/code/file/application (1) • It **looks** like a **legitimat**e computer program/file (1st) – Intended to get victim/target to open them (1) • When program/sw is run, malware is activated (1) • It creates a back door to gain access to a computer (1) • Trojans do not attempt to infect other files/replicate themselves (1) • It can allow the third party to: (any **2** of the following) (1) – Download content onto the computer – Copy data from the computer – Gain control of the computer – Set up a DDOS attack.	**3**

Question	Answer	Marks
5	**One mark per bullet point to a maximum of six marks.** Valid/Normal**//**Data that is from within the acceptable range (1st) • To test that the output is as expected/valid (1) • To test that it is accepted (1) Invalid/Erroneous**//**Data//Abnormal that is outside of the acceptable range (1st) • Data is of the wrong **type/**invalid (1) • To test that it is rejected (1) Boundary/Extreme**//**Data that is at the boundary (of the acceptable range) (1st) • To test that the boundaries are set correctly (1) • To test that the outcome is as expected – accepted and correct output (1)	**6**

Question	Answer	Marks
6(a)	**One mark per bullet point to a maximum of two marks.** • To indicate time has passed between two scenes in a video (1) • To ease the emotions of the audience after a troubling scene (1) • To create suspense after/before a pivotal/important moment (1) • So that the audience are **aware** of the end/beginning. (1) • To provide a **smooth** transition between scenes (1)	**2**
6(b)	**One mark per bullet point to a maximum of two marks.** • To provide context • To provide information//better understanding (1) • Identifies author (1) • Identifies sound track (1) • Captions can help viewers engage with your video (1) • Search engines use metadata like captions to understand a video's content (1) • To provide translations (1) • To allow watchers to read what is being said//reason why what is being said may be inaccessible (1) Note This may be combined with “better understanding” to achieve two marks.	**2**

Question	Answer	Marks

7	*Example solution:*
	Count ← 0
	REPEAT
	INPUT mark
	IF mark > 70
	THEN
	OUTPUT "You have achieved a Distinction"
	ENDIF
	IF mark >= 55 AND <= 70
	THEN
	OUTPUT "You have achieved a Merit"
	ENDIF
	IF mark >=40 AND <= 54
	THEN
	OUTPUT "You have achieved a Pass"
	ENDIF
	IF mark <40
	THEN
	OUTPUT "You have not reached the Pass mark"
	ENDIF
	Count ← Count+ 1
	UNTIL Count = 20
	
	Eight marks from:
	• Initialise Count before Mark variable is input (1)
	• REPEAT in correct logical location (1)
	• Input Mark (1)
	• Correct Distinction grade **criterion**//correct fail **criterion** (1)
	• Correct Merit grade **criterion**//correct Pass grade **criterion** (1)
	• **Correct** Increment of Count (1)
	• Increment of Count is within the loop (1)
	• **UNTIL** Count = 20 (1)
	• UNTIL in correct position (1)
	• Use of one IF…ENDIF (1)
	• All OUTPUTs correctly match the criteria (NOT awardable if BP4 or BP5 not awarded) (1)
		8

Question	Answer	Marks
8(a)	**One mark per bullet point to a maximum of four marks.** • It operates/controls a device **attached to the computer** (1) • It provides an interface between operating systems/applications software and the device (1st) – Which handles the translation of requests between a device and the operating system (1) • It allows an operating system to detect/identify the peripheral device (1) • Activates the device when it is needed and deactivates it when it is not needed (1) • Logs and reports errors (1) • Defines where data must be cached (1)	**4**

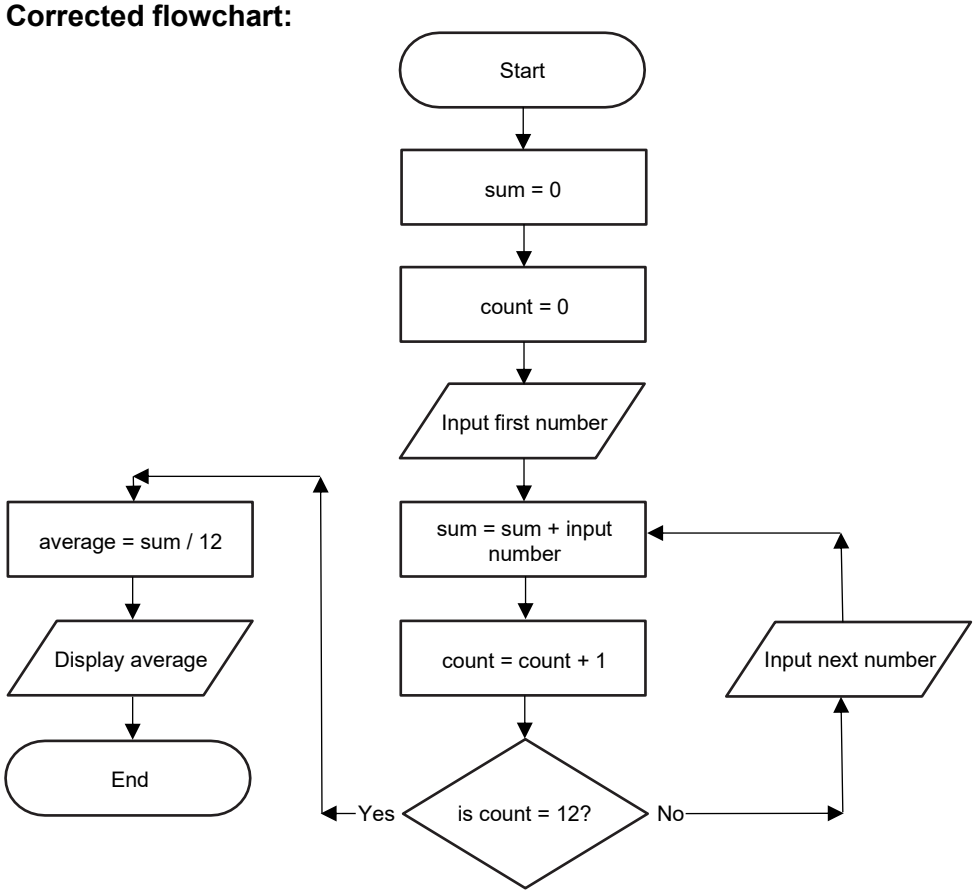
Question	Answer	Marks
8(b)	**One mark per bullet point to a maximum of four marks.** • Translates a high-level language into machine code (1) • Creates an executable file (1) • Identifies errors in code (1) • Stops interpreting code when an error is found//shows errors as it translates (1) • Errors are dealt with as they are found//immediately (1) • Uses less RAM as only one line at a time is stored/processed (1)	**4**

Question	Answer	Marks
9	**One mark per bullet point to a maximum of five marks.** • A vehicle passing over the loop causes a change in inductance (1) • The change in inductance is used to detect the vehicle (1) • The metal in the vehicle causes a change in the magnetic field (1) • The change in the magnetic field causes a current to flow (1) • Loop sends back data which is converted to digital (1) • Computer compares data to pre-set value (1) • **If computer detects** a change, (1st) – it sends signal to the actuator (1) • The actuator will raise/lower the barrier. (1)	**5**

Question	Answer	Marks
10(a)	**One mark per bullet point to a maximum of three marks.** • Optimises space on the disk (1) • Files are better organised (1) • Increases reading and writing speeds (1) • Related files are kept together (1) • Files are contiguous (1) • Data retrieval is quicker//files are opened more quickly (1) • Reduces the movement of the read/write heads (1) • Increases longevity/life span of the disk. (1)	**3**
10(b)	**One mark per bullet point to a maximum of three marks.** • It can take time to do (1) • It can use a lot of computer memory (1) • It can use a lot of computer processing (1) • It can make the computer less responsive (1) • It can lead to file corruption (1) • The power must be on/uninterrupted **throughout the whole process**. (1) • Shortens the life of SSDs (1)	**3**

Question	Answer	Marks
11	**Eight marks from:** **MAX four for 1st marks only** *Evaluations:* E.g.: • Can interrogate/interact with databases to extract data (1st) – So data only has to be typed/entered in once (1) • Can only use the features of the spreadsheet (1st) – Therefore model may be limited (1) • Spreadsheet software may include unneeded features (1st) – Which could be a distraction//which need to be hidden//increase file size (1) • Spreadsheets include formulae//functions (1st) – So complicated calculations can be created more easily (1) – Reduced chance of error (1) • Calculations can be performed more quickly/more easily/recalculated automatically (1st) – so spreadsheet can be used by someone who does not spreadsheet editing skills (1) • What-if statements can be asked/edited (1st) – without rebuilding the model/spreadsheet from scratch each time (1) • Creates graphs (1st) – Which allows data to be more easily interpreted (1) • Graphs that are produced will automatically change (1st) – as new values are added/old values altered (1) • Models/spreadsheets provide objective results (1st) – not affected by user's bias (1) • The use of templates provides consistency over time (1st) – therefore do not need to relearn the model (1) • Valid conclusion drawing together/based on arguments presented in the answer (1)	**8**

Question	Answer	Marks
12(a)	• A composite key is a primary key that uses the contents of two or more fields from a table to create a unique value. (1)	**1**
12(b)	• A compound key is a primary key that combines more than one foreign **key** to create a unique value. (1)	**1**

Question	Answer	Marks
13	**Max five marks from:** • Add sum = 0 (sum initialisation) (1) • Add count = count +1 (iteration of count) (1) • Replace average calculation from * to / (1) • Reverse Yes/No correctly (1) • Add end shape (1) **Corrected flowchart:**  	**5**