CAMBRIDGE
International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/12**

Paper 1 Theory **February/March 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 February/March 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
BOD	Benefit of the doubt
	To indicate where a key word/phrase is missing
	Incorrect point
	Indicate a point in an answer
LNK	Two statements are linked
NAQ	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.
REP	To indicate a point that has already been made or was given in the question
SEEN	Indicates that work/page has been seen including blank answer spaces and blank pages.
	Correct point
TV	Too vague
	Indicate a point in an answer

Question	Answer	Marks
1	**One mark per bullet point to a maximum of five marks.** • Information is data with context (1) and meaning (1) • This could be about e.g. a student/lecturer/employee/payroll system (1) **Any examples of the data presented with context or meaning (interpretation) (max 5 – each item of data may only be used once)** e.g. • Chandra could be the **first** name. (1) • 59 could be their age. (1)	**5**

Question	Answer	Marks
2	**One mark per example and reasonable expansion.** • First mark – any reasonable reason why a checker may miss issues **when comparing two documents** (1st) • Second mark – example of the error in practice (1) **Answer must be in the context of comparing two documents and not be about proof reading.**	**2**

Question	Answer	Marks
3(a)	**One mark per bullet point to a maximum of six marks.** **ADWARE** • To generate income/revenue **for an identified 3rd party** (the software developer/creator/user sending it) (1) • Generates/places adverts (1st) – usually within the user's default browser. (1) – may be in the form of **pop up or adverts** on a website (1) • Installs itself/without user's knowledge (1st) – when installing a (different) program app (1) • Can create open doors for malicious programs (1) • Can track user's search/browsing history (1st) – to better target ads/create targeted marketing (1) – user's information can be sold to third parties. (1)	**6**

Question	Answer	Marks
3(b)	**One mark per bullet point to a maximum of four marks.** **RANSOMWARE** • Locks/encrypts/blocks access to files/devices/systems (1) so they cannot be used (1) • Works at root level to disable access to files/devices/systems (1st) – May also target backups. (1) • Hacker **contacts the victim** and demands a ransom (1) • Software usually can't be removed/access cannot be regained until the attacker receives a ransom payment. (award the concept of **regaining** access via payment here) (1)	**4**

Question	Answer	Marks
4(a)	**One mark per bullet point to a maximum of three marks.** • An expert system is able to consider various factors/inputs (1st) – such as distance/traffic/driver workload/customer preference (1) • It is a more efficient method of solving the task. (efficiency in production or of outcome – accept either, but , production of outcome OR quality of outcome must be stated) (1) • Fewer **scheduling**/human errors (1st) – such as forgetting about time windows/overlooking optimal routes/drive availability (1) • The company will be able to keep their scheduling system active 24/7 (1) • Reduced expenses/fuel usage/wear and tear (1). • Chooses the quickest/most fuel-efficient route (1) • The company will be able to scale their operations//An expert system will allow for improved business scalability/no need to employ new staff **as business grows** (1) • Able to produce a picking order (1) • Deliveries can be loaded in reverse order of delivery (award concept of) (1)	**3**

Question	Answer	Marks
4(b)	**One mark per bullet point to a maximum of six marks.** • Gather information about delivery processes. (1) • TWO marks for items of information that would be gathered (e.g.) – Distances (1) – Locations (1) – Speed limits (1) – Capacity of individual vehicles (1) – Road capacities (e.g. low bridge clearances) (1) • Consult with expert schedulers to understand decision-making processes/rules followed/schedule trade-offs. (1) • Decide how to encode/design/create//gather the acquired knowledge (1) turning it into a knowledge base. (1) • Define/create rules base (1) • Any example of a rule that may be in the rules base (1) • Design/create a user interface (1) that allows schedulers/users to interact with the system (1) • Create the inference engine (1) • Create the explanation system (1) • Test the system with archived data/real-world data/simulated scenarios (1) and improve as necessary (1)	**6**

Question	Answer	Marks
5	**One mark per valid validation check identified (max 5) and justification given to a maximum of eight marks. Max six if only one of student number or examination score used.** • A **format check** (1st) – To ensure **student numbers** match the expected format/To check/while checking if **student numbers** starts with letter followed by 5 digits. (1) • A **length check** (1st) – To ensure **student numbers** have the correct/expected number of digit (1) • A **check digit** (1st) – To help prevent/detect typos/errors during entry of **student numbers**/As a redundancy check for **student numbers** (1) • A **lookup check** (1st) – To help verify that a **student number** exists in a master list// a/the **student number** belongs to an actual student enlisted/registered at the school. (1) • A **consistency check** (1st) – To ensure no duplicate/multiple records exist for the same **student number** against the same examination (1) • A **range check** (1st) – To ensure that the **exam score** falls within the valid/expected range of 0 to 120 (1) • A **limit check** (1st) – To ensure lowest **exam score** of 0/**highest exam** score of 120 (1) • A **type check** (1st) – To ensure that the **student number** field had data entered as text only (1) • A **type check** (1st) – To ensure that the **exam score** field had data entered as numeric only (1)	**8**

Question	Answer	Marks
6	**One mark per valid description to a maximum of four marks. E.g.:** • Expand broadband access/improve infrastructure. (1) • Establish/support community centres with computers/internet access. (1) • Offer workshops/courses to teach residents computer skills/ICT (1st) – such as – accept any suitable use of ICT (online or offline) (1) • Educate residents on//raise awareness of any identified aspect e.g. cybersecurity/online safety/technology. (1) • Establish equipment loan programs (1) • Equip schools with improved/better/latest technology (1) • Subsidise access to internet (1) • Subsidise purchase of computer equipment (1)	**4**

Question	Answer	Marks
7	**FOUR marks available. TWO per matched answer.** • Identify a suitable feature of a spreadsheet (1) • State how this feature can be used for the purpose (1) **E.g.:** **Award first answer in each section only, unless no answer written in Way 2.** • Manually store/save data about a student's scores/progression (1) to create a record of the student's performance. (1) • Automation/Formulas could be implemented in a spreadsheet (1) to calculate/predict averages of a given/specific time frame. (1) • Conditional formatting could be used in a spreadsheet (1) to highlight grades that meet a set criteria/condition. (1) • A graph/chart could be created from data (1st) – To represent/visualise a student's progression overtime in any given time/test. (1) • A complex/advanced spreadsheet with formulas that function across sheets could be created (1st) – To compare results/scores/progression/trends across different students/groups/classes/tests. (1) • Sort scores into date order (1) so progress over time can be seen (1)	**4**

Question	Answer	Marks
8	**One mark per bullet point to a maximum of three marks.** • Authenticates **packets** of data (1) • Encrypts data **at source** (1) • Decrypts data **at destination** (1) • Provides secure communication **between two computers/across the internet** (1) • IPsec is used in a virtual private networks (VPNs) (1) • Negotiation of cryptographic keys to use during a session. (1)	**3**

Question	Answer	Marks
9(a)	**One mark per bullet point to a maximum of three marks.** • Does not actually erase/delete the data (1). • Removes the reference from the directory table//index in the HDD/SSD. (1st) – so that the file can not be found//search facility would not work (1) • Data is still written/remains on the storage device (1st) – until overwritten by new information. (1)	**3**
9(b)	**Two marks for a full explanation.** • Because data has not been removed/deleted from storage device (1) instead space it has been made available for the OS. (1) • Because while no new information overwrites old/previous/deleted data (1) it can potentially be recovered/accessed using specialised software. (1) • Because they are sent to the **recycle** bin (1)	**2**

Question	Answer	Marks
10(a)	**One mark per bullet point to a maximum of two marks.** • Sets the peak amplitude/loudest part of a track to a specific level. (1) • Makes multiple tracks have the same gain/peak/relative volume. (1) • Helps increase the volume of an entire audio track proportionally. (1) • Helps achieve consistent volume levels across different audio files. (1) • Helps maximising overall volume levels without compromising sound quality (1)	**2**
10(b)	**One mark per bullet point to a maximum of two marks.** • Eliminates/removes unwanted sounds. (1) • Makes audio track/signal clearer. (1) • Plays a mirror image of the original audio track (1st) – to partially cancel noise out. (1)	**2**

Question	Answer	Marks
11	**EIGHT marks available.** **Benefits (max 7):** e.g. • Can provide results that are generally difficult to measure (1st) – such as e.g. reaction times. (1) • Can simulate a range of scenarios (1) • Some scenarios do not happen frequently in real life (1) • Can simulate driving in different vehicles. (1) • Reduces anxiety level//improves confidence of (new) learners. (1) • Can be repeated any number of times. (1) • Can be customised/personalised to the learner's needs. (1) • Simulation can be recorded (1) • Can analyse mistakes (1) and suggest solutions (1) • Simulation can be frozen to allow for questions/discussion (1) **Drawbacks (max 7)** e.g. • May not have enough data/information to create some scenarios. (1) • May not accurately predict the occurrence/effects of human behaviour. (1) • Might provide misleading scenarios if information was incorrectly/erroneously inputted/added. (1) • Can require high-end hardware for optimal performance increasing price. (1) • May give drivers a false sense of security regarding their ability to drive. (1) • Not a real-world experience (1)	8

Question	Answer	Marks
12	**One mark per bullet point to a maximum of eight marks.** 1 Start and stop correct shape (1) 2 Two relevant questions asked in diamond shape (1) 3 Third relevant question asked in diamond shape (1) 4 Any use of YES and NO leading from any relevant question (1) 5 Any example of Yes and No logic BOTH correct (logic must match the question being asked) (1) 6 User ID input message (1) 7 Password reminder input message (1) 8 User ID Error message (1) 9 Answer Error message (1) 10 Email/message sent (1) 11 Loop back to start (from any error) (1) 12 Inputs and outputs in parallelograms (may be 1) (1)	8

