

Cambridge International AS & A Level

INFORMATION TECHNOLOGY**9626/33**

Paper 3 Advanced Theory

May/June 2026**MARK SCHEME**Maximum Mark: 70

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

This document consists of **11** printed pages.

General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: - the specific content defined in the mark scheme - the specific skills defined in the mark scheme or in the level descriptions - the standard of response required as exemplified by the standardisation scripts.
2	Examiners must award whole marks (not half marks, or other fractions).
3	Examiners must award marks positively . This means that: - marks are not deducted for errors or omissions - marks are awarded for correct/valid answers as defined in the mark scheme and also for other valid answers which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate - the quality of spelling, punctuation and grammar are judged only when the mark scheme indicates that these features are specifically assessed in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must consistently apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the full range of marks defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and must not award marks with grade thresholds or grade descriptions 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

Mark scheme abbreviations

/	separates alternative words / phrases within a marking point
//	separates alternative answers within a marking point
Underline	actual word given must be used by candidate (grammatical variants accepted)
max	if available, indicates the maximum number of marks that can be awarded
()	the word / phrase in brackets is not required, but sets the context
(1st)	indicates that this mark has to have been awarded to be able to award the dependant marks denoted with (1)

Note: No marks are awarded for brand names of software packages or hardware.

Question	Answer	Marks
1(a)	TWO from: • How connections are created / set up between devices // type of connection • How data is to be packaged / arranged for transmission / reception / exchange • How data is to be addressed / labelled for transmission / reception • How the data travels across / finds its way across / is routed across / between networks.	2
1(b)	TWO from: • Each device has unique (address / identifier) • Provides an address on a specific network / specifies the addressing system to be used (1st) divides address into / gives each device a network part and local part (1) • Specifies how addresses are stored / included in every data packet (travelling over an (IP) network) • Uses 32 / 128 bit addressing to allow large numbers of addresses to be made available.	2
1(c)	TWO from: • IPv4 addresses are nearly all allocated / used up so need more addresses • IPv6 provides many more addresses (to allow for the vast number of devices using IP networks) • IPv6 uses 128 bits for address / IPv4 uses only 32 bits.	2
1(d)	FOUR from: • Source address of sending NIC / device // MAC address • Destination address of receiving / intended recipient NIC / device • Protocol used by software / application that sent / has to process the packet (e.g. FTP, SMTP) • Error checking / checksum (in IPv4) • The 'hop' count / time to live (TTL in IPv4) / hop limit (in IPv6) • How many devices / nodes before packet is dropped (when count is 0) • Total length of packet • Information about the data payload.	4
1(e)	ONE from: • IPv4 header is variable in length // IPv6 header has fixed length • IPv6 has no checksum / error checking of packet (IPv6 assumes error checking is done by datalink / application layers) • IPv4 has fixed position for packet option information bits / IPv6 shows position of bits of data by offset from start of header / variable position of option bits.	1

Question	Answer	Marks
2(a)	TWO from: - Longest path (from task to task) through the project - The shortest possible time for completion of project - Longest sequence of tasks / activities that must be done on time in a project / to finish the project.	2
2(b)	FOUR from: - Identify the dependencies between tasks - Create network diagram / PERT / Gantt chart of the tasks - Estimate / state the duration of each task - Allow for contingency time - Work out the longest sequence of tasks (needed to finish project) // longest route through the project - Calculate the shortest (possible) time in which project can be finished / completed - Calculate the (total) float.	4

Question	Answer	Marks
3(a)	TWO from: (Supporting project) planning - Allocation of resources - Enables communication between (project) team members - Enables collaboration between (project) team members.	2
3(b)	SIX from: - No (local) installation is required - Reduces hardware requirements / only needs a web-browser / can run in any (modern) browser - Runs on low-powered devices // no need for high-powered / performance devices - Runs on mobile devices / smartphones / tablets - Can access while away from office / project site / onsite / from home // remote access - No requirement for (local) servers / application servers - Web-based PMS provider / cloud provider / third party is responsible for maintenance (1st) so reduced initial / maintenance costs (1) - increased security / protection against data loss - Backups managed by administrators / third party / PMS provider / remote storage - Team members can access up-to-date copies / work together on tasks - Increased / improved collaboration between team members - Increased productivity - Progress can be (more easily) tracked - Individual contributions to project can be monitored / tracked.	6

Question	Answer	Marks
4	EIGHT from: ONE from: - A valid description of technical documentation EIGHT from: - Explains / describes the purpose of the application so end-users / (future) developers know what problem(s) it was designed to solve / what it can do - Includes design specifications for all features / parts of application (1st) valid example of content: e.g.: input screens / output / print / display formats / user interface screens (1) valid example of navigation / data flow through system e.g. system flowcharts / data flow diagrams (1) details of program language / code (1) used for maintenance during product lifetime (1) used when updating product to enable technicians / future developers to maintain / improve application after deployment / release (1) - Provides information to stakeholders about features / capabilities (1st) enables decision-making about enhancements / amendments / changes (1) records development progress / activities (1) - Users can solve problems / trouble shoot problems themselves (1st) so no need to call support services (1) reduced number of support calls reduces costs to developer / supplier (1) - Users can discover / learn / train to use the software independently (1st) reduces training costs / time (1) - Provides safety / security warnings / potential problems / issues (1st) for end-users / future developers (1) (Can be) used as basis of advertising / marketing materials.	8

Question	Answer	Marks
5(a)	THREE from: - Are decentralised so there is no (easy) method of checking / viewing / monitoring transactions - Are unregulated so are not controlled / overseen / managed by (individual) governments - Supply (of cryptocurrency) is uncontrolled so value may rise / fall unpredictably / without warning - Rapidly fluctuating / changing value / amount (of cryptocurrency) may undermine / destabilise the local / country economy so there are price rises / inflation / deflation / loss of value against other countries currency - Transactions can be anonymous so more criminality / illegal activities / tax evasion - Money can move out of / into country without regulation / unnoticed, so local / own currency is devalued / affected - Not backed up by assets.	3

Question	Answer	Marks
5(b)	ONE from, e.g.: - Ban / make illegal the use of cryptocurrency in their country / for international transactions - Block all access to cryptocurrency systems - Amend / add to existing laws / regulations - Create / introduce government-controlled own (digital/cryptocurrency).	1

Question	Answer	Marks
6(a)	FOUR from e.g.: - Headsets with cameras / microphones (worn by visually impaired person) connected to sighted person / operative viewing onscreen (1st) - Max TWO from: - guiding the person with spoken instructions via headphones / headset (1) - connected by 5G (1) - AI used instead of operative (1) - Smartglasses displaying information / images of surroundings with enhanced colours / shapes (1st) - Max TWO from: - Use of augmented reality to overlay information (1) - Change contrast of scene to make shapes obstacles stand out (1) - Highlight signs / warnings by altering colours (1) - Implantation of devices / light sensors / camera in eye (1st) - Replaces part of retina (1) - Connects to brain via optic nerve (1) - Implantation of receiver in rear of eye (1st) - Receives data from camera on smartglasses via Bluetooth / radio (1) - Connects to brain via optic nerve (1) - Use of robotic technology to map / scan / reshape retina (1st) - To improve focussing of light rays (1).	4
6(b)	TWO from e.g. (augmented reality using) smartglasses overlaying additional information when visiting sites / tourist attractions (augmented reality using) head-up displays overlaying additional information when driving / piloting aircraft / playing games - Improving night vision when driving / military / aircraft pilots / mining activities.	2

Question	Answer	Marks
7(a)	TWO from: - To force users to enter data in a specific way / type - To ensure that the data entered is in the correct / appropriate / right format for entry into a computer system / decreases errors - To restrict the choices made by a user.	2
7(b)	FOUR from: - Lists can be very long with users having to scroll a long way down the list / many not fit on screen - Can be overlooked by users / not used - Choices are hidden by default / before use - Too many drop down boxes on a form can be confusing / demotivating - User may not change the default entry / make any choice (in order to complete form quickly) / choices are limited / can make only one choice - Choices may not be exactly what user wants - Answers cannot be expanded by user - Default entry cannot be checked by other validation methods / always accepted into form - May revert to default value (when refreshed) - Loading times may be increased.	4

Question	Answer	Marks
8(a)	FOUR from: - Is an open format so anyone can use it - supported by all web browsers so is browser / device independent // Is compatible with (almost) all applications so can be used to transfer images between applications - Supports lossless compression so no loss of quality / images retain their quality - Not subject to generational degradation so can be edited / resaved without loss of quality - Supports progressive display so viewers can see image before all / whole set of data is downloaded - Designed for viewing on (computer) screens so colours are consistent - Supports transparency so is preferred to other formats / e.g. JPEG.	4
8(b)	TWO from: - Graphics Interchange Format / GIF (1st) - Supports 256 colours (1) - Uses 8 bits per pixel (1)	2

Question	Answer	Marks
9(a)	FOUR from: • In a function • (id) refers to the HTML element being affected / referenced in the function / statement (1st) Passed from variable to function (1) • Value of 'none' sets (display property of element) to hidden / not seen • No space is shown where element is hidden • Viewer does not know element is present if hidden because there is no empty space // entire element is hidden from view • 'none' is the default value.	4
9(b)	THREE from: • Visibility property only affects specific part of HTML element // display property affects the entire element (1st) so no need to code for each separate element in a block of elements (1) • Visibility property removes space where element was (1st) • ONE from: so web page is tidier / neater (1) user does not know element is present (1) • Display property leaves a blank space (1st) • ONE from: so web page is less tidy / neat (1) user knows an element is present (1) • Display has many (more) options / values (1st) so can achieve many different visual effects on element (1).	3

Question	Answer	Marks
10	EIGHT from: <i>Benefits</i> e.g.: Max SIX from: • Real-time information overlay adds to the user's understanding of their environment / what's going on around them • Can get information about tourist attractions / shops / travel / places to see / visit • Overlaid directions can assist in navigating unfamiliar locations (1st) without recourse to maps / asking for directions (1) more up to date than maps (1) 'live' updates on suggested routes / travel (1) • Product information can be displayed when looking at items/objects/attractions (1st) up to date prices / costs / valid details of object (1) • Information is hands-free no need to search maps / look at apps on (smart)phone always available / no reliance on maps that can be lost • Can 'try on' clothes without actually wearing them (1st) no need to handle / physically wear clothes (1) can try range / combinations of clothes / goods (1) <i>Drawbacks</i> e.g.: Max SIX from: • Requires wearing of smartglasses (1st) can be obtrusive / uncomfortable (1) can obscure important objects in environment (1) can increase danger / reduce safety when moving (1) • Requires (continuous) power supply to/in (smart)glasses (1st) increase need to carry batteries / power sources / recharging (1) • Requires uninterrupted communications / internet (1st) increased costs / may be poor coverage / not be possible (1) requires high speed connection (1) • Collection / processing / storage of user data raises privacy / security concerns (1st) location / use / behaviour / preferences (1) requires consent (1) • Can be addictive / over-reliance on technology (1st) alter user interaction with environment / other people (1) may hinder face-to-face interactions / physical activity (1).	8