CAMBRIDGE
International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/32**

Paper 3 Advanced 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(a)	**One mark per bullet point to a maximum of two marks.** • (An HTML Event is an action / occurrence) that happens in a web page / change in (interactive) element • by a user • by the browser.	**2**
1(b)(i)	**One mark per bullet point to a maximum of one mark.** • (start a script) when the mouse pointer moves / hovers over an element / image.	**1**
1(b)(ii)	**One mark per bullet point to a maximum of one mark.** • (start a script) when the mouse pointer moves away from / off an element / image.	**1**
1(b)(iii)	**One mark per bullet point to a maximum of one mark.** • (start a script is triggered) when a page has (completely) finished loading / is fully loaded into a browser.	**1**

Question	Answer	Marks
2(a)	**One mark per bullet point to a maximum of two marks.** • Each peer is equal in status to every other peer • Each peer functions as a client on the network • Each peer functions as a server on the network • The client and server functions occur at the same time / simultaneously • Peers connect directly to other peers / no central control / server / decentralised.	**2**

Question	Answer	Marks
2(b)	**One mark per bullet point to a maximum of six marks.** ***Max 5 from :*** *Benefits:* • reduced costs • no need of central server • no specialised networking knowledge is required • specialised technical / maintenance staff are not needed • failure of one peer does not affect the others • dedicated network operating system is not required • file transfer can be restarted if interrupted ***Max 5 from :*** *Drawbacks:* • files / resources are not centrally organised • finding required files / resources may be difficult / time-consuming • no central backup of files • increased risk of virus / malware spread • system / device / network performance can be compromised (1st) • if there are many peer-to-peer devices (1) • reduced security of (personal) data (1st) • because peer-to-peer devices have access to all other devices (1).	**6**

Question	Answer	Marks
3(a)	**One mark per bullet point to a maximum of two marks.** • Software instances / versions of server (1st) • run in RAM (1) • Has its own / separate / independent OS / server software • Running on hardware shared with other virtual servers.	**2**
3(b)	**One mark per bullet point to a maximum of two marks.** • Collection of individual servers • function / work as one server • Work loads are shared / balanced across the individual servers • Managed by a central server unit • CSU schedules / assigns tasks to individual servers.	**2**
3(c)	**One mark per bullet point to a maximum of one mark.** • Alternative instances of the virtual server can be running very quickly / replace original • Minimal disruption to service when maintenance / upgrade is carried out / failure of original • Reduced use / costs of power to run servers • Reduced maintenance / hardware costs • reduced physical space.	**1**

Question	Answer	Marks
3(d)	**One mark per bullet point to a maximum of one mark.** • If host server fails then all the virtual servers fail • Possibility of data leakage between virtual servers (due to use of shared RAM) • Access via the internet can cause security issues / disruption if connectivity failure • Backing up data is more difficult / complex.	**1**

Question	Answer	Marks
4(a)	**One mark per bullet point to a maximum of two marks.** • (Part of a) sequence • can contain images / shapes / objects / text (in a frame) • contains all the parameters / information about the objects / shapes • can be key (frame at start / end of sequence for changing position / appearance of objects) • can be property (frame at start / end / in sequence for changing properties / parameters / appearance of objects).	**2**
4(b)	**One mark per bullet point to a maximum of four marks.** • frame rate is number of frames per second • (low number of frames) means flicker will become apparent / movement is jerky / on-off / stop-go • high / increasing number of frames per second / drawing more frames for a movement means movement appears smooth // fewer frames per second less smooth • increase the (running) frame rate reduces the length of the animation / finishes faster / sooner (1st) • unless more frames are added (1).	**4**

Question	Answer	Marks
5	**One mark per bullet point to a maximum of three marks.** • (When sending) converts data from applications into correct format for transmission / passing to next layer / layer 5 / session layer (1st) • because different software applications use different / their own file format / syntax (1) • Interface between application and session layer // prepares data for application / session layer • Applies (any) encryption required • (When receiving) decrypts data from session layer / layer 5 • Converts data into format software application can use / uses.	**3**

Question	Answer	Marks
6(a)(i)	**One mark per bullet point to a maximum of one mark.** • contingency time • amount of time a task can be delayed before affecting the start time of next task / dependent tasks • amount of time a project can be delayed without affecting the final finish time.	**1**
6(a)(ii)	**One mark per bullet point to a maximum of one mark.** • point in time (in a project) when tasks / activities / criteria are met / reference point • marker at significant point / stage in project / change in project conditions.	**1**
6(b)(i)	**One mark per bullet point to a maximum of two marks.** • Finish-to-Finish dependency / task cannot end until another task also ends • Start-to-Start dependency / cannot start until another starts • Start-to-Finish dependency / one task cannot finish until another task has started.	**2**
6(b)(ii)	**One mark per bullet point to a maximum of two marks.** • shows / inform managers the order in which tasks should be carried out • enables allocation of resources • helps to avoid delays (in the project) • enables construction of Gannt charts • enables calculation of critical path.	**2**

Question	Answer	Marks
7	**Command word: Discuss – write about issues(s) or topic(s) in a structured way.** *E.g.:* *Positive impacts:* • Increase in achievement gives lifetime skills // greater achievement in workplace / higher // enhanced social lives • students can take part in classes that they would not otherwise be able to // increases range of study // more knowledge gained • well-prepared / motivated students more likely to complete / finish the courses // more likely to go onto more courses / more learning • Increase in independent learning by students so more likely to succeed / increase knowledge • More likely to understand their aims / goals / assignments • Increase in technology literacy during lessons / learning at school / college *Negative impacts:* • poor quality lessons / materials / teachers unsuited / untrained / unskilled in technology demotivates students / decrease in achievement in classes / courses • lack of direct support so less access to clarification • decrease in achievement in classes / courses (1st) • over / in lifetime (1) • less disciplined teaching environment (1st) • so reduced motivation (1) • more likely to drop out. **One mark per bullet point to a maximum of eight marks.**	**8**

Question	Answer	Marks
8	**One mark per bullet point to a maximum of six marks.** ***Max 5 from :*** *Benefits: e.g.:* • Used for online and offline transactions • Integrated into existing payment systems • Used to facilitate cross-border / international payments • Accounts / easier for people to access financial services and participate in the digital economy • Provides a digital alternative to cash • Beneficial for those with limited access to traditional banking services • Provide a secure digital payment service • Provide reliable digital payment service ***Max 5 from :*** *Drawbacks: e.g.:* • Allows increased surveillance of financial transactions • Could raise privacy and security concerns • Costly / complex implementation of CBDCS • Security risks associated with the integration of CBDCS into existing payment systems • Increased competition to traditional from CBDCS (1st) • decline in their profits (1) • reduction in the availability of banking / credit facilities (1).	**6**

Question	Answer	Marks
9(a)	**One mark per bullet point to a maximum of four marks.** *E.g.:* • Use of inter-connected sensors / devices / appliances to gather data / personalise / customise home environment • Creating smart homes / automated home systems e.g. heating / cooling / lighting • Automatic re-ordering of goods / provisions / switching energy providers • Remote control of devices / home systems • Remote monitoring of security / video / door bell-mounted cameras.	**4**

Question	Answer	Marks
9(b)	**One mark per bullet point to a maximum of four marks.** *E.g.:* • Devices are not always compatible / must be compatible with each other • Security (of data) / privacy issues raised by use of connected devices / unprotected devices • Voice assistants may operate / record in continuous mode / monitor every conversation / sound in the home • Conversations picked up by voice assistants may reveal personal / confidential details to third parties / supplier of assistant • Use of central control / voice assistant to monitor / control other devices collects data from around the home • Smart TVs controlled by voice commands connect to servers to parse / decode the human commands so listen to all conversations. • Increased use of energy / power (by all the devices) is environmentally unfriendly / costs more • Automatic / unwanted re-ordering by devices may result in unexpected / extra / higher costs / bills • Failure of complex systems (using IoT) can lead to loss of e.g. control over heating / lighting / valid example • Reduction in human skills as more reliant on technology.	**4**

Question	Answer	Marks
10	***Command word: Discuss – write about issues(s) or topic(s) in a structured way.*** **One mark for a valid description of phased implementation e.g.:** • system changeover / replacement in different time slots / periods in different parts of an organisation **One mark for a valid description of direct changeover e.g.:** • totally remove original system and replace with new system at once. **One mark per bullet point to a maximum of eight marks.** ***Max 5 from :*** *Advantages: e.g.:* • End-users can be trained on new terminals in smaller group • So become gradually used to using the new terminals system • New terminals can be tested in one section before replacing other terminals • Evaluation of new terminals in one section before moving on to the next • Smaller workforce / less technicians needed to install terminals compared to e.g. direct changeover • During replacement in one section sales can continue on other sections / customers can pay at other checkouts while change is occurring in one section / store does not have to close during implementation. ***Max 5 from:*** *Disadvantages: e.g.:* • No fall-back option for the terminals that have been replaced / old terminals have been removed so are not available if the new ones fail • Can take a very long time to fully implement / changeover to a whole new system / all new terminals in all sections • May have to update / change other parts of checkout system in phases if new terminals are not (fully) compatible.	**8**

Question	Answer	Marks
11	***Command word: Analyse – examine in detail to show meaning, identify elements and the relationship between them.*** **One mark per bullet point to a maximum of six marks.** • Resizing / scaling a vector image does not affect the quality of the image / does not pixelate on enlarging / zooming into an area • Vector images can have smaller file size (for a given image size) • Do not use / require as much disk space for storage • Download faster than bitmap image • Can be used / displayed on low-power / small storage space devices / tablets • Edges / lines are smooth(er) in vector images without jagged / pixelated appearance (1st) • producing a higher quality image / lines (1) • Photographs do not appear realistic (1st) • because vector images / gradations of colour / surfaces are unrealistic in photographs (1) • Small / minor drawing / editing errors / mistakes (made during creation) are more visible in vector images than in bitmap images (1st) • which reduces the image quality (1).	**6**

