Cambridge Assessment International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/03**

Paper 3 Advanced Theory **For examination from 2025**

MARK SCHEME

Maximum Mark: 70

Specimen

This document has **10** pages. Any blank pages are indicated.

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 descriptions for the question
- the specific skills defined in the mark scheme or in the generic level descriptions 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 descriptions.

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 descriptions in mind.

Question	Answer	Marks
1(a)	**One mark per bullet point to a maximum of three marks.** • Objects/drawings made (on paper/boards/screens in starting position) / artefact positioned. • Set up capture method/device. • Objects/artefact moved/changed/improved. • Each drawing/object is captured/photographed/digitised at each stage of development/at time intervals. • Screen captures/photographs used as key frames. • Software used to create intermediate frames for the animation.	**3**
1(b)	**One mark per bullet point to a maximum of three marks.** • To draw attention to (small) changes/movements in the primary components/main graphics/objects. • To enhance/emphasise the action/movement of the primary components/ main graphics/objects. • To bring a scene to life / enhance the enjoyment of a scene by a viewer. • To set the mood/emotion of a scene. • To add context.	**3**

Question	Answer	Marks
2	**One mark per bullet point to a maximum of six marks.** • Learners who are home-based through illness or who live far from school have access to education / can be included in classes. • Learners can connect with other learners in a variety of locations or in different places, learning different points of view from a wider range of students. • Learners see and hear real people in different classrooms, complementing their independent study. • Learners can collaborate on projects and share resources and ideas through video-conferencing. • Video-conferencing gives learners more choice about where they do their learning. • Learners can take virtual field trips to dangerous/remote areas in safety, so do not miss out on a variety of learning experiences. • Learners have more time to learn due to time saved in travelling to school or to meet other learners, giving more time in a day than would otherwise be possible for learning.	**6**

Question	Answer	Marks
3(a)(i)	**One mark per bullet point to a maximum of one mark.** • (To represent) a process. • Place which receives input data and produces output with a different content/form.	**1**
3(a)(ii)	**One mark per bullet point to a maximum of one mark.** • Data store/repository. • Place where data is kept for later use / use by process.	**1**

Question	Answer	Marks
3(b)	**One mark per bullet point to a maximum of two marks.** • Straight lines between/connecting symbols. • Arrows at end to show direction of data flow / incoming arrows are input data flow / outgoing arrows are output data flows.	**2**
3(c)	**One mark per bullet point to a maximum of three marks.** • Gives an overview of the whole/entire system. • Gives a starting place for analysis. • (Usually) has only one process shown. • Does not contain any data storage. • Shows data flow between the whole system and external entities (e.g. customer/supplier). • Adding more detail produces a level 1 diagram.	**3**

Question	Answer	Marks
4	**One mark per bullet point to a maximum of five marks.** • CMYK uses four colours (cyan, magenta, yellow, key/black). • CMYK is subtractive/subtracts colours to create other colours. • Amount/intensity of each colour can be varied to create (vast) range of colours. • CMYK uses ink to produce colour on a medium/paper/hardcopy medium/ surface. • All CMYK colours together produce grey. • K/key/black is required to produce true black. • No CMYK colour is white / colour of paper/medium/surface. • RGB images are converted to CMYK for printing/sending to publishers.	**5**

Question	Answer	Marks
5(a)	**One mark per bullet point to a maximum of four marks.** **To achieve full marks, candidates must include at least one example.** • Used to model situations whilst not putting patients in danger/at risk whilst doctors learn new skills. • Used when situations are rare to give a broad range of experiences. • Used to reduce organisational requirements where multiple trainee doctors need access to multiple patients. • Allows trainee doctors to examine 3D models of organs/patient's anatomy. • Allows trainee doctors to practise communicating with patients. • Helps trainee doctors learn and practise skills required in surgery/ medical/emergency procedures. • Helps prepare trainee doctors for a high pace, zero error and complex working environment.	**4**

Question	Answer	Marks
5(b)	**One mark per bullet point to a maximum of four marks.** **To achieve full marks, candidates must include at least one example.** • Used to allow medical professionals to show patients information about their condition / help them to visualise how treatments will work. • Used to reduce pressure on availability of medical staff as treatment/ information sharing replaced by virtual reality. • Situations can be tailored to meet medical requirements of the patient and repeated if successful. • Immerses patient in an interactive environment that distracts/soothes/ reassures/reduces stress. • Helps block pain signals from reaching the brain, reducing chronic/acute pain. • Helps rehabilitation/physical therapy after surgery/physical injury/sports injury. • Helps improve cognitive therapy of patient after brain injury/stroke / helps patients learn/relearn activities and recover abilities. • Assists patients to adapt to/get used to prosthetics.	**4**

Question	Answer	Marks
6	**One mark per bullet point to a maximum of six marks.** • (Remote) video cameras to watch public spaces for criminals/wanted individuals/terrorists. • Facial recognition (software) to identify/track movements of individuals. • Voice-recognition software to identify individuals on recorded/live conversations. • Interception of telephone/internet communications between individuals. • Monitoring software to determine individual internet activities. • Analysis of social media activities to track/monitor individual activities. • Remote-controlled drones with surveillance technology to track individuals in cities/difficult terrain. • Remote listening devices/‘bugs’ to hear/record conversations to track activities. • Devices with GPS capabilities to track movements/electronic tags with GPS to send location information/alerts to law enforcement. • Data mining to look for trends in large data sets to help identify criminal activities, for example, sales, geographical location, etc.	**6**

Question	Answer	Marks
7	**One mark per bullet point to a maximum of eight marks.** **One mark can be awarded for a reasoned conclusion.** • Reduction in the need for investment/paying for new/up-to-date hardware and software ... • ... which can reduce costs so banks can make more profit for owners/ investors/savers/shareholders. • Reduction in the need for ownership of hardware/software/IT services means that banks can choose services as and when they need them ... • ... so (further) reducing costs. • Banks not responsible for managing the IT systems/services ... • ... so no need for (expensive) IT personnel so reducing staff costs. • (Third-party) cloud provider specialises in providing data protection/fault tolerance/disaster recovery ... • ... so provides a higher level of expertise at a lower cost than the bank ... • ... so the bank's data is better protected ... • ... so supplies new services more quickly/at lower cost without need for bank to invest in new technology ... • ... so providing customers with extra services more quickly/reliably/at lower cost. • Reduction in energy usage by bank as services are transferred to/ provided by third-party providers ... • ... which is more environmentally friendly. • (Third-party) cloud computing may be less secure than in-house IT services because it requires networking/internet use ... • ... so customer/bank data may be more likely to be lost/stolen/ compromised by unauthorised users ... • ... and a security breach (due to cloud computing) could damage the bank's reputation/lose customers and cause bank to close/fail. • Cloud computing may involve customer (financial) data being moved/ stored to other countries/stored on the same servers as other data ... • ... which may be in breach of/non-compliance with laws/regulations so bank may be subject to investigation by regulatory authorities/ prosecuted/fined.	**8**

Question	Answer	Marks
8	**One mark per bullet point to a maximum of six marks.** **One mark can be awarded for a reasoned conclusion.** **Maximum of four marks for advantages:** • Fibre optic cabling provides higher capacity than copper cabling so can carry more 'lines'/connections to (more) customers. • Fibre optic cabling provides higher bandwidth for customers' internet use. • Fibre optic cabling can carry signals/connections over longer distances so can reach remote customers/customers in remote locations. • Signal level is not attenuated (as much over long distances). • Fibre optic cabling is (often/can be) physically smaller for pulling/installing in existing ducts/channels. • Fibre optic cable is made of glass/not metallic and therefore is more resistant to corrosion/water damage/electromagnetic interference/animal attack/damage/chewing. **Maximum of four marks for disadvantages:** • Fibre optic cabling can be more expensive. • Fibre optic cabling requires more transmitters/receivers/transceivers so costs are increased. • Fibre optic cabling cannot carry electrical power so additional cabling may be required to provide power to transceivers/exchanges/switches. • Fibre optic cabling can be more difficult/costly to repair/rejoin. • Fibre optic cabling requires more skill to install so companies may struggle to find enough skilled engineers.	**6**

Question	Answer	Marks
9	**One mark per bullet point to a maximum of six marks.** **One mark can be awarded for a reasoned conclusion.** • Individuals do not have control over their private data/cannot give (informed) consent to its use/distribution/sharing … • … as stored data can be accessed and mined without the consent of individuals. • … as (many) organisations/businesses do not make customers aware that (individual) data may be used in data mining. • … as data obtained by data mining may be used in ways/for purposes that individuals were not aware of/did not consent to when providing the data to an organisation/business. • … as data may be sold to other organisations without the consent of the individual • Data is aggregated in preparation for data mining … • … which can expose individual data to organisations/companies that did not collect it. • Anonymity of individual data is not/cannot be guaranteed … • … so individual activity may be identified. • Data integrity can be compromised which can leave (redundant) data … • … this may be accessed/updated/amended by others when passed on to other parties. • Personalised information (e.g. credit card data/contact data/identity data) may not be anonymised during complex data mining … • … which means it may remain possible to link data back to individuals.	**6**

Question	Answer	Marks
10(a)	**One mark per bullet point to a maximum of three marks.** • Have a specific function/purpose that is already defined / no need to write new code each time. • Cannot be used as names/identifiers for variables/functions because they are reserved for use by the language and will confuse the language/ interpreter. • Must be written in lower case otherwise will not work. • Must be written/have the correct syntax otherwise an error will occur/will not work.	**3**
10(b)	**One mark per bullet point to a maximum of three marks.** • Used with // to have a single line of comment so that everything after is ignored. • Used with /* and */ to have multi-line comments so that everything in between is ignored. • Adding // in front of a code line/statement changes the code line from an executable line to a comment so that it is ignored and can be used to test different/alternative lines of code. • Used to explain the purpose/function of the code to make it easier to understand/follow/maintain. • Used to insert lines/gaps in the code to make it more readable/legible.	**3**

Question	Answer	Marks
11	**One mark per bullet point to a maximum of four marks from two different groups.** **Maximum two** from stakeholders: • Carry out a stakeholder analysis / identify stakeholders. • Divide stakeholders into groups, e.g. based on influence and interest levels. • Determine what influence/input the stakeholders will have in/during the project. • Identify the stakeholders who need to approve the project. **Maximum two** from resources: • Analyse/determine the resources required. • Run a feasibility study to determine if the project can be carried out / if there are enough resources for the project. • Create a list/lists of resources that will be required for the project. • Calculate the return on investment (ROI) to determine if the project is worth carrying out. **Maximum two** from high-level plans: • Create a high-level schedule/plan for the project. • Create a list/lists of tasks required for the project. • Determine the order of completion of tasks. • Determine the major milestones to assess the progress of the project. • Determine the deadlines for project completion. **Maximum two** from team: • Assemble the team required to carry out the project. • Organise the team structures for the project. • Collect/organise the software/tools to use for the project, e.g. project management software.	**4**

Question	Answer	Marks
12	**One mark per bullet point to a maximum of two marks.** • To personalise/customise emails/documents for team members so that they show individual team member names/titles. • To personalise/customise standard documentation with graphics/graphs/charts/colours/information without having to rewrite each document. • To change the content of standard documentation with conditional formatting according to need/requirement of recipient/team member (accept valid example). • To select/skip recipients/team members depending on need to include them in/exclude them from the mailing. • Saves time compared to creating individual emails/editing individual documents.	**2**

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