Cambridge Assessment International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/33**

Paper 3 Advanced Theory **October/November 2023**

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 October/November 2023 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

[Turn over

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 descriptors 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.

Question	Answer	Marks
1	**Six from e.g.:** • Medical conditions/treatments can be discussed/shared between sufferers for self-help • Raise awareness of (new/emerging/annual) public health issues/practices • To alert the public to new/emerging public health issues • To direct viewers to reliable/more in-depth sources of information/where to get help/advice from health professionals • To combat disinformation/false ideas/views on health issues/treatments • To answer/reply to common questions about health care/issues • To monitor public health issues/conditions from individual posts/discussions • To encourage discussions of sensitive/embarrassing health issues • To support (groups of) patients/sufferers of specific diseases/conditions • To connect health care professionals with other health care professionals around the world • For recruitment of volunteers into research programs • Used in the marketing/advertising of treatments/care facilities • Allows feedback on health care treatments/facilities to be publicly posted. • Links to websites that can show symptoms of illness to help self-diagnosis • Links to websites that show/suggest treatments of illness/conditions for self-help	**6**

Question	Answer	Marks
2(a)	**Three from:** • Software tools do not check for artistic/author styles *(Manual proof-reading) checks for:* • for content issues/check that all necessary content is present • no unnecessary content is included • confusion between homophones • correct use of indefinite/definite articles/prepositions • misplaced punctuations/commas/hyphens/apostrophes • consistency in styles/conventions/number notation/date format • correct formatting of quotations and citations • inconsistent paragraph indentation and spacing • missing or misplaced page numbers, headers and footers • no unnecessary duplication of content • correct regional spelling/grammar/syntax is being used • correct context.	**3**

Question	Answer	Marks
2(b)	**Four from:** • Use of fill-in field in the location of required date data • Can be set up to prompt for input of date • Set up to only request date once • Syntax is { FILLIN ["*Prompt* "] [*Optional switches*] } • Prompt shows text to appear to user as merge proceeds • Optional switches determine how the typed in text is used • \d "" provides a default text within the quotes if no user input is provided • \o ensures that the text entered at prompt is only requested once and then appears in all subsequent merged invitations.	**4**

Question	Answer	Marks
3	**Six from e.g.:** • Use of Bezier handles to change angle of line/curve that starts/ends at anchor/node/control point • Moving node/anchors/control point to change the start/end points of Bezier curves (that make up rounded shape) • Moving/dragging node from one position to another/co-ordinates on the image canvas • Adding node to line to divide line into two and moving new node • Deleting nodes to join lines and remove curves/angles in the lines • Group/ungroup shapes to allow for movement/scaling of parts of images • Changing the colour/transparency/size/rotation of shape/object in the image • Manually editing/amending the code/instructions in the SVG XML file.	**6**

Question	Answer	Marks
4	**Six from e.g.:** *Use of TEL:* • directs learning to specific goals (so increases motivation) • can lead to increased effort • by enhancing the meaning/learning/retention of materials • can increase persistence in the effort leading to increased motivation to succeed • can increase the comprehension/cognition of topics by use of multimedia/feedback/self-assessment so increasing motivation • can increase performance/success so increasing motivation to continue • means users are willing to spend more time using technology c.f. time in a classroom (can increase motivation) • can be available as and when user wishes/learn at own pace • has control/increases choice (which increases motivation) • Allows control of route through/navigation increases interest of leaners • Allows self-assessment with regular/instant feedback (improves motivation).	**6**

Question	Answer	Marks
5	***Discuss: write about issues(s) or topic(s) in depth in a structured way*** **Eight from:** *Advantages:* ***Max 6 from:*** • No centralised system/server(s)/devices function independently • so failure of one device does not affect the others/only files on failed device are lost • Access to files is local/faster/does not need/require authentication • so workers/users may be more productive • No requirement for specialised/dedicated network operating systems/each device functions • as its own server/stores own files/exchanges files with any other • Less/no technical knowledge required to setup/maintain connections/network • so less technical/support staff/technicians are required • No central records of access are stored/users can remain anonymous • so can be used to share secret/confidential/illegal files • Network can be scaled/devices can be added with ease/no impact on network performance *Disadvantages:* ***Max 6 from:*** • Files/resources are not centrally organised/referenced • so can be difficult to locate specific files • Risk of malware/viruses is higher • as responsibility of management/prevention is on each user/not centrally organised • Security is lower as access/permissions/authentication is per device and not centrally deployed/managed/any one with access to the device can use all resources/access all files • Backup systems are per device and not centrally organised • so it's the responsibility of the user to backup files stored on that device • Company files/document templates may exist in different versions • so consistency across the company is difficult to achieve • Files required by workers cannot be previewed/scanned/checked before download/access from other devices • Remote access to other devices can be unsecured/easier/undetected • as there is no central control over access/users/authentication which may lead to files/data being compromised/stolen • if one device down may affect workflow of others. **Max 6 if all advantages or all disadvantages.** **Max 6 marks if bullets/list of points.**	**8**

Question	Answer	Marks
6(a)	**Two from:** • For use after the delivery/installation of the software/application/app • For use by technicians/software engineers who are maintaining the software/application/app • For use by technicians/software engineers who are re-developing the software/application/app in the future • Allows completion (of software) after the programmer is no longer available.	**2**
6(b)	**Six from:** • Source code with notes/comments that explain how (sections/modules of) the code work(s) • Data structures used within the software/application/app • File formats/file naming conventions that are used by the software/application/app • Details of (any) validation routines used by the software/application/app • Navigation layout/routes/methods/links/link map used in the software/application/app • List of variables/arrays used/comments on use of variables/arrays • Details of (any) internal details of a database such as tables, relationships, records, queries used in software/application/app • Details of (any) macro scripts with comments to explain each stage of the macro • Records of test logs and test results • Details of the security methods used in the software/application/app to protect data • Details of how the software/application/app is/can be installed • Details of how to backup and restore the software/application/app.	**6**
6(c)	**Two from, e.g.:** • User documentation for end-users explain the functions of the software application/app and how to carry out task with them • Requirements specification detailing the user requirements • System specification detailing hardware and software needed • Design specification with details of what the software will be able to do.	**2**

Question	Answer	Marks
7(a)(i)	• The numbers used/involved in an arithmetical operation.	**1**
7(a)(ii)	**One from:** • The order of the arithmetic actions that will be/to be performed between/carried out on operands/numbers • Can be specified/changed by use of parentheses/(s) • Same presence operations are performed/calculated/computed from left to right/along statement from start to end.	**1**
7(a)(iii)	• Used to give a value to a variable.	**1**
7(a)(iv)	• Fixed values/numbers/strings (stored in/assigned to a variable).	**1**
7(b)	**One from:** • Names of HTML objects/properties • Names of any HTML event handlers • Names of HTML window handler objects/properties • (Reserved) terms/words that are keywords/reserved/used in other web programming languages e.g. Java objects/properties.	**1**

Question	Answer	Marks
8(a)	**Two from:** • Unauthorised use of personal information • So that perpetrator can pretend to be another person/use their identity • Using the information (in an unauthorised manner) for personal gain • Using the information to cause harm/loss/disadvantage to victim • Combining valid identity data with false/fabricated data to create a new/synthetic identity.	**2**
8(b)	**Six from e.g.:** • Use of victim's identity when committing a crime/being questioned about a crime can bring innocent victim under suspicion/investigation/prosecution for these crimes • Difficult to prove innocence of crime when victim of ID theft/may have crimes/incidents recorded against name on police records/may be repeatedly accused of other crimes and suffer continued distress • Victim may be refused credit/finance/credit cards on basis of incorrect data stored by financial institutions (due to (fraudulent) use of ID by others) • Victims find it difficult to correct false information held by government/credit/security institutions • Victims can be left financially liable for fraudulent transactions/debts/purchases/taxes of others (who have stolen/used their ID) • Innocent individuals can be confused (in eyes of law enforcement/government agencies) with synthetic identities • Innocent victims may have false medical data added to their records when the identity thief uses their ID to gain access to medical services/insurance resulting in incorrect medical diagnosis/treatments • Victims can be left psychologically harmed/mental health issues (by theft of ID) • Adults may discover that they were victims of identify theft as a child/children's ID stolen and used before victim's adulthood so when child comes of age/reaches legal adulthood they have debts/financial harm/criminal records that are not theirs.	**6**

Question	Answer	Marks
9	***Evaluate: judge or calculate the quality, importance, amount, or value of something.*** **Eight from e.g.:** *For:* ***Max 6 from e.g.:*** • The variety of tools available in project management software can help drive a project forward. • Can collaborate with team members using communication tools in real-time • so that each team member is kept up to date/can deal with issues/problems as they arise/happen • Can share document with tools that allow individuals to edit/amend/update reports/allow transparency in actions/issues • Control/manage costs to keep track of expenditure/track budgets throughout the project • to avoid overspend/re-allocation of resources • Can help manage risks/forecasting problems/issues to enable control/mitigation of risk/problems • to enable the project to continue unhindered/uninterrupted • Can create reports in different formats/from various data sources/automatically send • to keep team members/management/stakeholders informed/updated • Can be intuitive to use/has dashboard-based interfaces which need little training • to use/simple to use and easy to install allowing quick implementation and start-up of projects *Against:* ***Max 6 from e.g.:*** • Can be expensive with costs outweighing the return on the investment (ROI) • Not economic to use/train users for some projects so company loses money on the project • Cannot carry out specialised task as well as dedicated/specialised software • so may not be used/may need to invest in/use specialised applications for some tasks • Head Office designs/project may be simple • so may not need PMS software/PMS software may complicate the project and delay competition/result in excessive costs • Automated alerts may slow work/interrupt work • because more time is taken on dealing with every alert/too many alerts/setting up all the alerts so project is delayed/costs overrun. **Max 6 if all fors or all againsts.** **Max 6 marks if bullets/list of points.**	**8**

Question	Answer	Marks
10	***Discuss: write about issues(s) or topic(s) in depth in a structured way.*** **Six from e.g.:** *Benefits:* ***Max five from:*** • Data mining analyses a vast amount of data from numerous source • to discover trends/relationships/links between data that are not (immediately) obvious • Retail businesses analyse historical data to be able to predict who may respond to advertising campaigns/targeted advertising • to increase sales/find new markets/customers • who may/may not respond to different advertising techniques using social media/emails/direct marketing/discounts/vouchers • who may/may not buy related goods/which goods may be related in terms of sales • Financial institutions analyses customer data to discover/detect fraudulent credit card transactions • to protect credit card owner/user • detect/determine what (type of) customers may/may not be a good risk for loans • Manufacturers analyse engineering/production data to detect faulty equipment/determine optimal control parameters • to increase quality/reduce errors/defects in their processes *Drawbacks:* ***Max five from:*** • Personal privacy issues of extracting data from internet activities/social networks/e-commerce/forums/blogs concerns the public • so people are reluctant to allow their data to be used/analysed so businesses cannot rely on the results of data mining to make informed decisions • Businesses may lose control of their customer data when it is used for data mining and may be/could be responsible for resulting any data loss/breach • Customers/clients cannot be sure/certain their data is anonymised during data mining/data cannot be traced back • so are reluctant to provide full details to businesses • Customers data must be kept secure during the data mining process • because any data loss will result in costs to the business/legal liability for the business • Data collected/determined/found/linked through data mining can be misused by businesses • to take advantage of vulnerable people/discriminate against a group of people. **Max 5 if all benefits or all drawbacks.** **Max 4 marks if bullets/list of points.**	**6**