www.dynamicpapers.com

Cambridge Assessment International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/31**

Paper 3 Advanced Theory **May/June 2020**

MARK SCHEME

Maximum Mark: 90

Published

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

© UCLES 2020

www.dynamicpapers.com

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.

© UCLES 2020

www.dynamicpapers.com

Question	Answer	Marks
1(a)	*Four from:* Computer file contains (standard triangle language (STL)) instructions for creating/printing object. File is produced from CAD application/software. Software breaks object into layers. Creates (3D) solid objects from computer instructions. Object is created/produced from liquid/powder material. Process is additive/material is added to existing material/layer by layer. Material in layers of binder material and powder/liquid (by inkjet printer). Printed object is finished by removing support parts. Any oversize printing is removed and finishing is done with fine grinding/polishing.	**4**
1(b)	*Six from e.g.:* Re-creation/repair of damaged bone structures by printing customised structures for use in surgical procedures. Creation of customised surgical implants to match patient anatomy. Creation of customised surgical prostheses to aid recovery. Bioprinting of tissues for use in surgical procedures/recovery. Creation of customised anatomical models for planning surgery/surgical preparation. Creation of customised surgical tools to match patient requirements. Creation of customised jigs/frames for use in surgical theatres/operating rooms.	**6**

Question	Answer	Marks
2(a)	*Three from:* UHD has resolution of 4 times the number of pixels as HD/3840 $\times$ 2160 pixels (8.29 megapixels) v. 1920 $\times$ 1080 pixels (2.07 megapixels). UHD has resolution of 4K/4096 $\times$ 2160 pixels. UHD has resolution of 8K/7680 $\times$ 4320 pixels (33.18 megapixels)/16 times HD. Increased dynamic range compared to HD. Increased colour depth compared to HD. More LEDs in a given area on screen increase the resolution so there is more detail.	**3**

www.dynamicpapers.com

Question	Answer	Marks
2(b)	*Eight from e.g.:* Internet bandwidth of c.25 megabits/sec is required. Bandwidth required for UHD is not available to all customers/from all internet providers. Satellite transmissions/signals can provide required bandwidth. Reduced number of channels will be available unless new satellites are brought into service. Wireless/mobile telephone/4G networks have restricted bandwidth so cannot provide ultra HD. Introduction of 5G will make ultra HD available but will require new phones. Copper cable networks can provide bandwidth/up to 100 Mbit/s as Cat 5 ethernet/Cat 6 1 Gbit/s. Copper telephone cabling can provide ultra HD. Distance from exchange is limited as bandwidth reduces over distance. Fibre optic cables can provide high bandwidth (10 Gbit/s). Cost of use of fibre to home/installation to home is high. Fibre to cabinet (FTC) may provide UHD to more homes. Fibre allows much longer cable runs so may reduce installation costs over long distances from exchange to home.	**8**

Question	Answer	Marks
3	*Eight from:* Social networks provide instant/intermittent reward to human brain so influence behaviours. Use of social networks becomes addictive/distracting so young people waste time/show behavioural changes. Social networks provide instant connection between people/groups of young people which is rewarding/helpful to organise trips/parties. Social networks provides connection between large groups/numbers of people at once/easily. Sharing of ideas/areas of interest reaches many people. Sharing of ideas/areas of interest can influence peoples' choices. Sharing of ideas/areas of interest can make people feel involved/share pictures of holidays. Social patterns can be altered/influenced by sharing on social media. Connections between geographically separated groups can be easier/bring groups together virtually to create/cause social change. Restrictions/limitations of ideas/views of young people through restricted access. Marginal/extreme views can be shared and made available to wider audiences. Increased visibly of ideas/views has moved balance of power from few to many people. Social media allows young people to air views/share ideas without having to engage with society at large.	**8**

www.dynamicpapers.com

Question	Answer	Marks
4(a)	*Six from:* Different access rights/permissions can be given to different individuals/groups of individuals. Set up as Access Control Lists. Works on files/folders/directories. Permissions on folder/directory may be cascaded down to files contained within. Files within a folder/directory do not (necessarily) have same permissions as folder/director. If a permission/access right is not explicitly set, the right is denied. Read permission allows only viewing of file/directory/folder. Write permission allows modification of files/deletion/creation/renaming of files (within folder/directory). Execute permission allows file to run/executed. Permissions must be set/mandatory if OS is able to run/execute file for user.	**6**
4(b)	*Six from:* *Advantages of symmetric:* Symmetric uses keys/same keys for encryption and decryption so that must be shared to access the data so sharing of keys (also) has to be secured. Symmetric can be less secure because keys have to be shared/confidentiality of shared keys cannot be guaranteed. Can be very/more secure as (can) use (fixed-size) block encryption rather than encryption of bits/multiple rounds of encryption (which encrypts the encrypted block over and over). Keys have no special properties so are simple to generate. *Advantages of asymmetric:* Asymmetric uses public keys which can be accessed by anyone so no need to send key to specific user. Asymmetric uses a private/confidential key (known only to owner) so is (very) secure/data can be transferred without danger of public access. Key size is large/1024 to 2048 bits so security is high. Keys are reusable saving time/cost for owner.	**6**

Question	Answer	Marks
5	*Six from:* Lossless compression retains data/pixels. Lossy removes data/pixels. Lossless/lossy compression reduces the file size. Lossless compression (usually) results in larger file size than lossy compression. Lossless compression avoids accumulated stages of re-compression/compression artefacts when editing images. Lossless compression allows editing to be (more easily) reversed whereas lossy does not. Lossless compression keeps original uncompressed image appearance whereas lossy can alter (perceived) appearance. Lossy compression can use variable compression. Saving/storing the file as in a compressed file format/jpeg.	**6**

www.dynamicpapers.com

Question	Answer	Marks
6(a)	*Four from:* Can use long runs/lengths of cable compared to copper cables. Low signal loss over long distances. Greater tensile strength than copper. Not susceptible to electrical interference. Not susceptible to weather/environmental damage. Can provide very high bandwidth/internet speeds for customers.	**4**
6(b)	*Three from:* Difficult/require special equipment to splice/join if broken. Loss of signal/light at joins. If bent too much (beyond their limited physical arc) they will break. Special test equipment is often required for testing. Highly susceptible to physical damage/being cut or broken during construction/renovation/building/disturbance works. Data transmission losses often occur when wrapped around curves with small radius.	**3**

Question	Answer	Marks
7	*Eight from:* Use of tools in WP/DTP/applications to check for spelling errors. Use of tools in WP/DTP/applications to check for grammatical/punctuation errors. Description of use of tool e.g. select area/text and check then correct errors. (Proof)read the documents to check for comprehensiveness/all the required information is present. Use of verification techniques to check for accuracy of data entry. Use of validation techniques to ensure data is sensible/acceptable. Check that the source document/file is correct/accurate/complete. Check that the correct merge fields are in the correct/intended place. Check the merge fields rules/code for accuracy/correctness/is working properly. Check for correct/appropriate spacing when document is merged. Check merge fields for correct/appropriate formatting that fits in with final document.	**8**

Question	Answer	Marks
8(a)	*Two from:* Component of a webpage/HTML document. Surrounded/contained between tags. Starting tag has <name of tag> and ending tag has </name of tag> Node which can have attributes. Node can have ‘child nodes’. Part of the Document Object Model (DOM) when browser has parsed/read/displayed the HTML into a page.	**2**

www.dynamicpapers.com

Question	Answer	Marks
8(b)	*Two from:* HTML document contains a <p> element with id="a1" HTML DOM is used to get the element with id="a1" (Line 7 changes the content of) innerHTML (to " Nigel changed this!").	**2**

Question	Answer	Marks
9	*Six from e.g.:* Data can be lost/stolen by unauthorised users/hackers using gaining access to storage devices. Data can be stolen by interception of network traffic/capturing of IP packets. Valid user accounts can be abused/accidently cause data loss/damage. Malicious attacks with viruses/trojans/malware that damages/deletes/alters data. Misuse of resources by (unauthorised) persons/devices. Eavesdropping on other users' activities can enable theft of data/ID. Failure of hardware/software may expose data to loss/theft/damage. No need to have physical proximity to computer to access/can access systems remotely.	**6**

Question	Answer	Marks
10	*Eight from e.g.:* *Advantages:* Accessible from anywhere/can include doctors/researchers from around the world. Interaction between experts from different areas is possible to gain wider opinions/comments. Can develop a group opinion. User groups/moderated comments can increase reliability/reduce offensive/disruptive comments. *Disadvantages:* Objectivity can be difficult to maintain when discussing medical issues. Can become little more than a group chat about symptoms with no focus. No way of verifying accuracy of comments. Comments can be added at any time. No non-verbal clues about participants are available. Posting of the same comment multiple times can cause dependability/reliability of data issues. ***Must have at least one from each to gain full marks.***	**8**

www.dynamicpapers.com

Question	Answer	Marks
11	*Five from:* *Similarities:* Morphing and tweening can both change the shape an object. Morphing and tweening can both change the motion of object. Morphing and tweening can both change the size/colour/location of object. *Differences:* Morphing changes one object into a totally/completely different object. Changes by morphing are smooth/fluid. Morphing (often) overlays grid on image and uses it to remap new image over old, whereas tweening uses location points. Tweening changes animated object's location/motion by creating intermediate frames. Tweening requires establishment of key frames. Tweening moves points of location of the object to new points whereas morphing does not (usually) do so. ***Must have at least one from each to gain full marks.***	**5**

www.dynamicpapers.com

Question	Answer	Marks
12	*Five from:* Key contents of a Data Protection Act include: 1 Personal data should be collected and processed fairly and lawfully. Data subject should be informed about the data being collected. Data subject should be asked for permission to collect it. 2 Personal data can be held only for specified and lawful purposes. Data subject should know why data is collected/stored. Law is broken if data is used for other purposes. 3 Personal data should be adequate, relevant and not excessive for the required purpose. Only data that is needed can be stored. 4 Personal data should be accurate and kept up-to-date. Wrong/inaccurate data must not be stored. Wrong/inaccurate data should be corrected. 5 Personal data should not be kept for longer than is necessary. Data must not be kept forever/unreasonable lengths of time/must be destroyed when no longer needed. 6 Data should be processed in accordance with the rights of the data subject. Data subjects can inspect the data held about them. Data subjects can insist that incorrect data is amended.	**5**

© UCLES 2020