Cambridge International AS & A Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary and Advanced Level

INFORMATION TECHNOLOGY **9626/33**

Paper 3 Advanced Theory **October/November 2018**

MARK SCHEME

Maximum Mark: 90

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 2018 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 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(a)	**Two** *from:* Crop tool to remove excess background/to show just the face Border line added to the whole image Resize tool to make image larger Saved as compressed (JPEG) format.	**2**
1(b)	**Six** *from:* The image in Fig. 1 has been created/saved as a bitmap Bitmaps are made of pixels The image in Fig. 2 has been saved as a compressed image with too much compression Loss of pixel/data during compression so detail is lost in the image of the face The compression artefacts are visible to the human eye The pixels in Fig. 2 are no longer small enough to be indistinguishable by the human eye When enlarged the pixels of the face/image become visible The face now looks unrealistic/blocky so the features are not distinguishable.	**6**

Question	Answer	Marks
2	**Eight** *from:* *Symptom: The air conditioning does not work at all:* Check that the power supply is connected to the power outlet Check that the power supply is on Check if a fuse has blown/a circuit breaker has been tripped Check if there has been a power failure/outage Check that the timer is set correctly *Symptom: The air-conditioning is not working properly:* Check if the air intake is blocked/clear Check if the air filter is dirty/clean Check if the temperature has been set correctly Check if there are any heaters on Check if there are too many people in the room. *Checks must be related to symptom.*	**8**

Question	Answer	Marks
3	**This question to be marked as a Level of Response.** **Level 3 (7–8 marks)** Candidates will evaluate, giving advantages and disadvantages of, a range of devices, in detail the use of Bluetooth® wireless technology for communication between devices. The information will be relevant, clear, organised and presented in a structured and coherent format. There will be a reasoned conclusion/opinion. Subject specific terminology will be used accurately and appropriately. **Level 2 (4–6 marks)** Candidates will explain, with advantages and disadvantages, the use of Bluetooth ® wireless technology for communication between devices. For the most part, the information will be relevant and presented in a structured and coherent format. There may be a reasoned conclusion/opinion. Subject specific terminology will be used appropriately and for the most part correctly. **Level 1 (1–3 marks)** Candidates will describe the use of Bluetooth® wireless technology for communication between devices. Answers may be in the form of a list. There will be little or no use of specialist terms. **Level 0 (0 marks)** Response with no valid content. *Answers may make reference to e.g.* Bluetooth® has... ..a range of applications/uses for wireless communications between devices like phones/ headsets/speakers/ ..a range of applications/uses for control of communications between devices *Advantages:* Bluetooth® requires minimal setup e.g. just a few button presses and (possibly) a 4 digit code so is easy to use/setup or pair/bond devices c.f. other network types Bluetooth® is low energy technology so suitable for mobile devices Bluetooth® is standardised so easy to implement/most devices will connect readily Bluetooth® is standard in a range of devices e.g. smartphones, speakers, headsets Bluetooth® is not easy to intercept nor will it easily interfere with other device connections	**8**

Question	Answer	Marks
3	*Disadvantages:* Bluetooth® is short-range Is affected by obstacles/walls that attenuate signals Drains battery power if range is at maximum Bluetooth® – enabled technology can be more expensive than non-enabled devices Bluetooth® has limited bandwidth.	

Question	Answer	Marks
4	**Six** *from:* Positional commands entered using GUI/text-based commands Specify required X-Y-Z positions 'Lead-by-the-nose' method by one person holding the end-effector and moving to positions... ...with recording of motions/positions Off-line programming to input the positions as code Mapping the positions in graphic format Use of a 'teach pendant'/hand-held control to move end-effectors and program the positions at the same time Robot simulation tools used to replicate and the positions/motion Record the data for programming real robot.	**6**

Question	Answer	Marks
5(a)	Stores multiple values in a single variable.	**1**
5(b)	Containers for storing data values.	**1**
5(c)	**One** *from:* A block of code designed to perform a particular task Code executed when it is invoked (called).	**1**
5(d)	**One** *from:* Text preceded by // is not executed/ignored by JavaScript Used to explain the code Used to halt execution of the code Text that is not executed before a line of code Text that is not executed at end of line of code.	**1**
5(e)	**One** *from:* A collection of variables and functions Representing the attributes and behaviour of an 'item'/'thing' being modelled in a program.	**1**

Question	Answer	Marks
5(f)	**One** *from:* Any (valid) unit of code that resolves to a value Two types of expression exist: .....can have a value .....can assign a value to a variable.	**1**

Question	Answer	Marks
6(a)	**Six** *from:* Installation of additional/two firewalls (to separate the servers from internal network) Installation of/configured a perimeter network/demilitarised zone/DMZ DMZ can be physical or logical subnetwork DMZ external node/computer system can only access the services in the DMZ and not the internal LAN The services accessible to external users are placed in the DMZ... ...email server and web server and FTP server Services for internal use are kept behind internal firewall so not accessible from the internet External firewall is the perimeter/front end and allows traffic destined for DMZ to pass Internal firewall is configured to allow traffic from DMZ to enter company LAN.	**6**
6(b)	**Four** *from:* The extra firewalls means that any attacker that gets past the first firewall would have to get past the second to access the company LAN An attacker could not be sure how many other firewalls would be found on the network One firewall is an external firewall and one is an internal firewall and could have different security The internal firewall security protects the data one LAN segment The external firewall security only has to deal with data from the internet The internal services are now protected by both firewalls.	**4**

Question	Answer	Marks
7(a)	**Two** *from:* <u>Real-time</u> collaboration/communication using web browsers between multiple users via/using the internet/network All users see the same screen at the same time in their web browsers Collaborative interaction between users/webinars/webcasts.	**2**

Question	Answer	Marks
7(b)	**Six** *from:* Uses TCP/IP connections providing end-to-end data communication (TCP/IP) specifies how data is put into packets and addressed... ...how it transmitted and routed ...how it is received Can use point-to-point/circuit switching methods to provide a secure link Point-to-point limits users to just two Requires web-hosting services Using HTTP/HTTPS as a protocol for transmission and display of data Has a database server optimised for use by other services/mobile applications Use of FTP to upload/download data files Use of IRC (internet relay chat) for text-based messaging Application layer technology used also for file transfer.	**6**

Question	Answer	Marks
8	**Eight** *from:* Face, hand geometry, and iris fit this parameter are easy to read quickly/highly collectable at the door Face, hand geometry, iris can be collected by machine/ computer system/ have a M/H Fingerprint, facial thermogram, retina and iris have a M/H /highly unique to individuals.... ...but can be found in every individual Iris, retina, voice and facial thermogram are acceptable to staff both in original collection and use at the door... ...must not be intrusive/embarrassing when collected/read parameter/have a M/H Face, voice and DNA fit this parameter are difficult/not easy to circumvent to prevent copying/use by several individuals Fingerprint, retina, iris, DNA do not change over time/be permanent so readings are repeatable ...facial thermogram is not permanent Voice is most acceptable, but not very unique Facial thermogram is unique, acceptable and easily collectable, but changes over time so would need to be re-measured often Fingerprint, Iris, Retina are most unique, collectable and accepted.	**8**

Question	Answer	Marks
9(a)	**Six** *from:* Students can access/learn from the tutorial in their own time/have a flexible schedule Can study in own familiar/comfortable surroundings Time is not wasted travelling to school/college/university No travel costs incurred as no travelling Students can often access/learn from the tutorial for free/no tuition fees Motivation is increased/students can work at own pace/ask extra questions/students feel empowered Students have access to 'live' interaction with tutors/teachers Students can have personalised/customised courses/tutorials.	**6**
9(b)	**Two** *from:* (Younger) students who are dependent on teachers for learning cannot use online tutorial effectively (Disabled/older/any) students might have difficulty with the technology No access to the internet/computer/IT services due to cost/lack of IT skills/expertise Not enrolled on course/too many students using the tutorial at once.	**2**

Question	Answer	Marks
10	**Eight** *from:* Voters can contact politicians/others with views/post views for others to comment upon so increasing their influence on politicians/government Extremist views/inaccurate/fake news can spread very easily Can (re-)connect with friends very easily/more often Can keep up to date with latest news/developments Difficult to keep views/personal activities secret/private Can become victim of e.g. cyber-bullying/victimisation Have more 'friends' Become more isolated from family/less interaction with others so more vulnerable to external influences/extreme views/radicalisation Less likely to share private/personal/confidential details in case it is shared widely Less trusting of friends in case they share personal details/ inappropriate images/conversations/facts Personal details are published leading to vulnerability to identity theft Background checks by prospective employers can check/reveal (embarrassing) social media postings. *Max 6 for all positives or all negatives.* *1 mark available for a reasoned conclusion/opinion.*	**8**

Question	Answer	Marks
11	**Six** *from:* CAM can produce items quicker than manual machines due to higher machining speeds CAM shows greater consistency of product as every finished product is the same CAM can have higher production rate as it can run continuously without much supervision CAM can produce more elegant/sophisticated shapes with greater ease than manual machining/methods CAM is more expensive than manual machinery so adds to production costs Costs may be offset by greater efficiency in e.g. speed of production/volume production CAM programs/CNC can take a long time to produce Need to be accurate/correct to ensure production of item is properly carried out.	**6**

Question	Answer	Marks
12	**Six** *from:* Tool that allows planning and executing a project from inception to completion Can provide tracking of workers/builders/who is doing what and when Can show if anyone is missing deadlines Can move tasks reschedule/around/interchange tasks Allows flexibility to cope with e.g. unforeseen problems Can allow resources to be sourced/allocated/delivered at appropriate times Project scheduling tools can make simple projects more complex than they need to be Project scheduling tools can be expensive/costly for small projects.	**6**