Cambridge IGCSE

INFORMATION AND COMMUNICATION TECHNOLOGY	**0417/13**
Paper 1 Written	**May/June 2019**
MARK SCHEME	
Maximum Mark: 100	

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.

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This document consists of **11** printed pages.

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		**Magnetic**	**Optical**	**Solid state**	**4**
	Blu-ray disc		✔		
	Hard disk	✔			
	Pen drive			✔	
	Flash memory card			✔	

Question	Answer				Marks
2		**Desktop**	**Laptop**	**Smartphone**	**4**
	A portable computer that would most easily fit into your pocket			✔	
	A computer that is not powered by batteries	✔			
	A computer that has the smallest screen			✔	
	A portable computer with a keyboard and with a built-in 15 inch monitor		✔		

Question	Answer	Marks
3	**Two** from: The data on the MICR is human readable easier to check the data Cannot be read by MICR if the cheque is illegally photocopied Higher security than using bar codes	**2**

Question	Answer	Marks
4	**Two** from: Noise of the printer will not be a distraction in a noisy environment The dot matrix is more resistant to an oily / dirty environment Don't have to fill the paper tray as often Uses multi-part stationery Can use carbonised paper	**2**

Question	Answer	Marks
5(a)	**One** from: Programs that control and manage the computer's hardware//it runs the applications software Interface between the computer hardware and the user applications	**1**
5(b)	Programs that allow the user to carry out specific tasks	**1**
5(c)	Linker Operating system	**2**

Question	Answer	Marks
6(a)	**Two** from: Be careful when opening emails from people you do not know Be careful when opening attachments from people you do not know Do not click on executable (.exe) files / batch (.bat) files sent to you Never give out bank details / PIN / passwords / personal details in an email Report any phishing attempts Do not respond to emails from addresses you do not recognise	**2**
6(b)	**Two** from: Use anti-spyware to remove pharming code Check sites carefully before a link is clicked Delay using a link sent in an email as some sites are time related Check the URL / web address of the website before you enter personal details Make sure you are on a secure website	**2**
6(c)	**Two** from: Never give your bank details / PIN / password/personal details over the mobile phone / text message Ignore text messages from numbers you do not recognise Report any smishing attempts Never click on links in text messages from unexpected people Never phone the phone numbers that are given in a suspect text message	**2**

Question	Answer	Marks
7(a)	**Four** from: **Similarities** A hub and a switch both are used to connect devices to form a LAN Both a hub and a switch use data packets A switch is a type of hub Both check/read the data packets **Differences** In a hub a data packet is broadcast / sent to every computer or device on the LAN whereas in a switch the data packet is sent to a specific computer Security is lower in a hub as all data is broadcast In the switch the destination address is determined/looked up before it is sent whereas in a hub data packets are sent to all A switch uses MAC addresses to locate the destination of the device whereas is a hub MAC addresses are not checked A switch uses a look up table to determine destination this is not required in a hub A switch is capable of more functionality / multiple VLANs but not in a hub To gain full marks both similarities and differences are required	4
7(b)	**Four** from: The devices automatically connect when they come into range Tablet sends radio signals to the printer / printer receives radio signals from the tablet Tablet receives radio signals from the printer / printer responds using radio signals A handshake takes place Award a mark for mention of use of 4 digit code for access / default code / auto connection with code / some devices don't need code Uses a band of 79 radio frequencies / channels The tablet computer randomly chooses one of the radio frequencies / channels to use If it is being used it chooses another at random until it finds a free one Uses spread-spectrum frequency hopping 2 marks can be awarded for a good description of the handshake.	4

Question	Answer	Marks
8(a)	<table><tr><td>**Field Name**</td><td>**Validation check**</td></tr><tr><td>Medical_ID_number</td><td>length check/check digit/type/character check</td></tr><tr><td>Blood_type</td><td>Lookup check</td></tr><tr><td>Date_of_birth</td><td>Format check/range check/length check</td></tr><tr><td>Contact_telephone_number</td><td>Length check/character check/type check</td></tr></table>	4
8(b)	Medical_ID_number	1
8(c)	Max **Six** from: Information about the patient : Medical_ID_number, Date_of_birth, Family_name, Doctor_name, Appointment_time, Contact_telephone_number, Current_medication, Blood_type 2 marks for all 8 items 1 mark for at least 6 items Heading –1 mark Fills the page and is clearly an online form - 1 mark Home / submit button – 1 mark Radio buttons for blood type / doctor / Drop down lists – 1 mark Calendar for appointment time – 1 mark Appropriate boxes to type in the details – 1 mark Must have the correct details but appropriate headings are allowed	6
8(d)	**Four** from: The image has been reduced in size The background and foreground colours have been inverted The image has been <u>rotated</u> anti-clockwise / counter-clockwise The image has been cropped	4
8(e)	**Five** from: System generates questions Inference Engine compares data Compares data with that held in the knowledge base Uses rules base Matches to the symptoms are found System generates a list of possible diagnoses	5

Question	Answer	Marks
9	**Six** from: Microprocessor is programmed with pre-set values Microprocessor reads data from the sensor Microprocessor compares sensor readings with pre-set values If the readings show there is a car present... ...the microprocessor sends a signal to the actuator Actuator opens/raises the barrier If the readings show no car present the microprocessor sends a signal to the actuator Actuator lowers the barrier	**6**

Question	Answer	Marks
10	**Three** Matched pairs: Electrocution from spilling drinks Use of RCB / Check insulation regularly / check equipment regularly / No drinks or food near ICT equipment Fire from sockets being overloaded or equipment overheating Use a CO^2 fire extinguisher / Don't cover IT equipment vents / check electrics regularly / don't overload sockets / ensure good ventilation Tripping over trailing cables Use cable ducts / fasten cables to walls / use wireless devices / hide cables under flooring Heavy equipment falling could injure someone Use strong desks / use large desks / secure equipment to wall or floor or desk	**6**

Question	Answer	Marks
11(a)	**Six** from: **Advantages** Bar code reader / QR reader / Magnetic stripe reader / RFID reader / Touchscreen is quicker to enter data than keyboard / mouse Bar code reader / QR reader / Magnetic stripe reader / RFID reader is more accurate when entering data than keyboard / touchscreen RFID reader / keyboard can input more information than magnetic stripe reader / bar code reader / mouse / touchscreen **Disadvantages** Chip / stripe / bar code readers / touchscreen have to be bought / keyboard / mouse comes with the computer Continuous use of mouse/keyboard can cause RSI but other devices do not cause this If data is typed in using a keyboard / touchscreen then this could lead to more input errors More limited options when using a mouse / touchscreen To gain full marks both advantages and disadvantages are required	6
11(b)	**Six** from: **Advantages of email** Fax the document needs to be printed therefore if the receiving fax is out of paper this cannot happen / An email does not need to be printed The document can be more easily lost if sent by fax as it is sent to a device in a library The fax machine must be switched on to receive the fax / Emails are received even if the computer is turned off The quality of the fax may be poor depending on the print quality The fax will print even if no ink is in the machine To use a fax in other documents it needs to be manually entered… …this could lead to errors If the line is busy there could be a delay in sending the fax Each sheet has to be transmitted separately in a fax No need to buy a fax machine if sending an email An email is sent directly to the inbox/a person / more private The email's data is digital therefore it can be directly used in other software It is faster to send an email than a fax The email could be sent to a number of different places at once The email could be sent to numerous devices at once The email can have the book order as an attachment **Disadvantages of email** Emails can be spam The content of the email can be changed electronically whereas the fax is permanent Emails can contain viruses To gain full marks both advantages and disadvantages are required	6

Question	Answer	Marks
12(a)	Visual verification Double data entry	**2**
12(b)	Max **three** from: Not all errors are found by either validation or verification separately Source document may contain errors Verification only checks that data is copied correctly Validation only checks if data is reasonable/sensible Max **two** from: Allow any correct example e.g. the mark registered for a student is incorrect on the source document and was copied Correct appropriate explanation of an example of a validation check; e.g. number of lates for a student is 7 misread as a 1; in a range check of 1 – 10	**4**

Question	Answer	Marks
13(a)	**Two** from: A function is a pre-defined piece of code Pass parameters / variables to functions Function has a pre-defined name in the software / reserved word They are used inside formulae A built in operation Allow 1 mark for examples SUM() / AVERAGE() / NOW() etc.	**2**
13(b)	The reference of the cell does not change when replicated Uses a $ to show the absolute reference	**2**
13(c)	**Two** from: Used if a range of cells are to be used many times Easier to remember a name rather than the cell references Example – a range of cells, constant value or a formula If the range of cells moves the reference remains within the workbook	**2**

Question	Answer	Marks
14	**Six** from: Output: 'Message about the journey' Input: Customer selects journey details Output: Message 'Please enter your card / swipe card' Input: Customer inserts card into chip reader / customer swipes card/customer places (contactless) card on reader Input: Data from the card is read by RFID / magnetic stripe reader / chip reader Output: message 'Please enter your PIN' Input: PIN is entered If incorrect, customer is asked to re-enter PIN Output: Message 'Do not remove your card' Output: Message 'Please remove your card' Output: Ticket is printed Output: Message 'Do you require a receipt?' Input: Yes / No selected Output: If Yes selected, the station EFTPOS terminal produces a receipt Output: verbal instructions on what to do	**6**

Question	Answer	Marks
15	To be marked as a level of response: **Level 3 [7 – 8 marks]** Candidates will address both aspects of the question and discuss/consider different advantages/disadvantages. The issues raised will be justified. There will be a reasoned conclusion. The information will be relevant, clear, organised and presented in a structured and coherent format. **Level 2 [4 – 6 marks]** Candidates will address both aspects of the question and discuss/consider different advantages / disadvantages although development of some of the points will be limited to one side of the argument. There will be a conclusion. For the most part the information will be relevant and presented in a structured and coherent format. **Level 1 [1 – 3 marks]** Candidates may only address one side of the argument, and give basic advantages/disadvantages. Answers may be simplistic with little or no relevance. **Level 0 [0 marks]** Response with no valid content Answers may make reference to e.g.: **Advantages** No danger of accessing inappropriate information Relevant information can be found quite quickly, if the information you need is local to the area and held in the historical records at the library Don't have to worry about having to have internet connectivity Less likely to be information overload compared to the internet Librarian can recommend what and how to search in the historical records Index makes searching more efficient **Disadvantages** Historical records have limited amounts of information Historical records only contain one type of information whereas the internet contains records from other places Can be slower to find relevant information than using a search engine The census contains hand written data that is scanned therefore could be difficult to read Manual records don't have multimedia to help explain information Data in the historical records is not in digital form therefore cannot be copied and pasted. More errors in transferring the data than from the internet Access is limited to library opening hours Historical records cannot find information from around the world quickly It can be slower to search for information compared to the internet	8