



Cambridge IGCSE™

INFORMATION AND COMMUNICATION TECHNOLOGY

0417/12

Paper 1 Written

May/June 2021

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.

Cambridge International is publishing the mark schemes for the May/June 2021 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This document consists of **10** 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		control	measurement	modelling	4
	Personal finance			✓	
	Weather forecasting			✓	
	Burglar alarms	✓			
	Weather stations		✓		

Question	Answer	Marks
2(a)	Speaker Screen	2
2(b)	Four from, for example: Order goods from the internet Use it to surf/search the internet GPS Telephone/internet banking Make/receive phone calls Instant message Streaming of music Streaming videos Text messaging Taking photos	4

Question	Answer				Marks
3	Scenario	Magnetic tape	RAM	ROM	4
	To store the current instructions in use by a computer		✓		
	To back up data from a school network server	✓			
	To store data temporarily		✓		
	To store the start-up instructions of a computer			✓	

Question	Answer	Marks
4(a)	Hacking	1
4(b)	Spyware	1
4(c)	Smishing	1

Question	Answer	Marks										
5(a)	<table border="1"> <thead> <tr> <th>Field name</th> <th>Data type</th> </tr> </thead> <tbody> <tr> <td>Number_of_moons</td> <td>Numeric: Integer</td> </tr> <tr> <td>Orbital_period</td> <td>Numeric: Decimal</td> </tr> <tr> <td>Rings</td> <td>Boolean</td> </tr> <tr> <td>Name_of_planet</td> <td>Text</td> </tr> </tbody> </table>	Field name	Data type	Number_of_moons	Numeric: Integer	Orbital_period	Numeric: Decimal	Rings	Boolean	Name_of_planet	Text	4
Field name	Data type											
Number_of_moons	Numeric: Integer											
Orbital_period	Numeric: Decimal											
Rings	Boolean											
Name_of_planet	Text											
5(b)	<p>Type_of_planet<>"Gas Giant" AND Number_of_moons >=1 AND First_observed >1800</p> <p>Only two ANDs correctly placed – 1 mark</p> <p>Type_of_planet – 1 mark <> "Gas Giant" – 1 mark</p> <p>Number_of_moons – 1 mark >=1 – 1 mark</p> <p>First_observed – 1 mark >1800 – 1 mark</p>	7										
5(c)	Pluto Haumea	2										
5(d)	It would take the value of A2 – 1 mark Changes the value into an integer/zero decimal places – 1 mark	2										

Question	Answer	Marks
6	<p>Eight from:</p> <p>Advantages Less expensive to fly the aircraft into the storm Less risk to life as there is no flight crew It can be flown closer to the storm Time taken to receive the data is shorter as don't have to land the aircraft before sending data Results are processed immediately On board computers can analyse the data continuously Readings can be taken more frequently</p> <p>Disadvantages The sensors could malfunction and there is no way of repairing them easily You can lose the signal due to the electrical charges in the storm Less responsive Slower to react May go out of range</p> <p>To gain full marks there needs to be advantages and disadvantages</p>	8

Question	Answer	Marks																				
7(a)	<p>Three from: The systems analyst is creating a system that is just for the client Important to meet the needs of the user; so it is customised Reduces the costs if the new system matches the existing hardware and software More efficient system is produced that does what the users require</p>	3																				
7(b)	<table border="1"> <thead> <tr> <th>Activity</th> <th>Analysis</th> <th>Development and testing</th> <th>Evaluation</th> </tr> </thead> <tbody> <tr> <td>Identifying the problems with the current system</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>Comparing the solution with the original task requirements</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>Create the file structure</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>Identify limitations to the new system and improvements to be made</td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table>	Activity	Analysis	Development and testing	Evaluation	Identifying the problems with the current system	✓			Comparing the solution with the original task requirements			✓	Create the file structure		✓		Identify limitations to the new system and improvements to be made			✓	4
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Create the file structure		✓																				
Identify limitations to the new system and improvements to be made			✓																			

Question	Answer	Marks
7(c)	<p>Direct changeover – 1 mark</p> <p>Two from: Benefits are immediate Costs less as fewer staff are needed Costs less as only one system is required Less likelihood of malfunction as system is fully tested</p> <p>Parallel running – 1 mark</p> <p>Two from: If new system fails, old system can be used as a back up Possible to gradually train staff</p> <p>Phased changeover – 1 mark</p> <p>Two from: If the new system fails, only one part is affected Easier to ensure that part of the system is fully operational before moving onto the next part Possible to train staff in one part of the system, therefore less costly than parallel Possible to gradually train staff</p>	6

Question	Answer	Marks
8	<p>Matched pairs from, for example:</p> <p>I always check whether wires are damaged/loose when I plug in my computer equipment ...This will reduce electrocution</p> <p>I always check whether sockets are safe/not broken when I plug in equipment... ...This will reduce electrocution</p> <p>I only plug in one plug per socket ...This reduces the chance of fire</p> <p>I make sure all wires are fastened to the wall/placed under carpets/in ducts//Use wireless... ...This reduces tripping hazards</p> <p>Check and install circuit breakers... ...This reduces electrocution/fire hazard</p> <p>Make sure no drinks or food is brought near to computers... ...This reduces electrocution</p> <p>I make sure computer vents are not covered... ...This reduces the chances of fire</p> <p>I make sure all IT equipment is safely in the middle of desks//I make sure strong tables are used to store IT equipment/I don't store IT equipment on high shelves... ...To stop them falling on me and causing an injury</p>	6

Question	Answer	Marks
9(a)	<p>Two from:</p> <p>Send/receiving emails Send/receive attachments/files Internal file transfer within the company Allows the creation of extranets Surf internal information/webpages Sharing/use of applications/resources</p>	2
9(b)	<p>Four from, with descriptions:</p> <p>Email Use of the web Newsgroups Online chat Streaming Internet telephone Online conferencing Gaming File transfer</p>	4

Question	Answer	Marks
9(c)	<p>Benefits Max four: Can reduce cyber bullying/hate speech/sexual harassment Can reduce social media from being used for illegal activities Can reduce the ability to incite violence/trolling Could prevent people from being subjected to inappropriate messages Can reduce illegal/inappropriate images</p> <p>Drawbacks Freedom of speech is reduced Would be very difficult to police as there is a massive amount of information Different rules in different countries and social media crosses borders Very costly to create an effective deterrent Could force individuals to use other un-policed methods of communication Who decides what is acceptable and what is not acceptable Privacy issues as people checking could read messages Difficult to police as users can be anonymous</p> <p>To gain full marks there needs to be benefits and drawbacks</p>	8

Question	Answer	Marks
10	<p>Six from: Advantages to employees Staff are more flexible when they work so they can carry out other activities Staff are more contented as they can work hours which suit their home life They can start later/earlier so they avoid rush hour in the morning, so they do not arrive stressed They can start earlier/work later to avoid rush hour in evening so cuts travel time Compressed hours can lead to longer holidays/weekends therefore staff more refreshed Part time working allows people with other commitments to work Job sharing allows a piece of work to be completed using the skills set of more than one worker therefore cutting stress Working from home allows employees to balance their home life</p> <p>Advantages to the company Working from home allows the company to employ people from around the world Working from home allows the company to save costs by not needing large offices Helps employers retain their employees... ...therefore cutting training/recruitment costs Flexi-time allows company offices to remain open longer Job sharing reduces training costs</p> <p>To gain full marks there needs to be advantages to both the employees and the company</p>	6

Question	Answer	Marks
11	<p>Max four from:</p> <ul style="list-style-type: none"> Adds a level of security Verifies the email comes from a known and trusted source Provides the receiver with a means of reply/private key Used for initialising secure SSL connections between web browsers and web servers <p>Max three from:</p> <ul style="list-style-type: none"> Details of the owner of the digital certificate Serial number Public key Digital signature Subject name Valid from Valid to//Expiry date 	5

Question	Answer	Marks
12(a)	<p>Four from:</p> <ul style="list-style-type: none"> Information overload Web sites at the top of the list may not be relevant May be more irrelevant information Search engines may not include all web pages If a website loads faster, it is given priority Search engine company may be paid to display certain web pages 	4
12(b)	<p>Six from:</p> <ul style="list-style-type: none"> Check the author of the website as anybody can publish their understanding of a topic Check if the website has excessive advertising Check the content/advertising of its own products of a website to see if it biased Check the final part of the domain name of the URL Example .ac, .gov, .org Check if site is endorsed by reliable/reputable people/organisations Check if it has links to other reliable sites Check if it has testimonials/reviews Check if the author's credentials are good Check if information is comparable to other information from reliable authenticated experts Check if the date of the last update was a long time ago Check if website has excessive spelling and grammar mistakes Can compare information from other sites to see if it is reliable 	6
12(c)	<p>Two from:</p> <ul style="list-style-type: none"> Select the position for the table Click on Insert then table Select/type in 2 columns and 5 rows Type in the data 	2

Question	Answer	Marks
12(d)	<p>Max three from: Highlight Scientific name row Right click select insert Click Insert new row below</p> <p>Or</p> <p>Highlight Pouched row Right click select insert Click Insert new row above</p> <p>Max three from Click on right hand cell in the row Click insert...pictures Locate/select picture Insert the picture Format the picture</p>	4