



Cambridge IGCSE™

INFORMATION & COMMUNICATION TECHNOLOGY

0417/12

Paper 1 Theory

October/November 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 October/November 2021 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This document consists of **9** 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(a)	Two from: Touchscreen Touchpad Webcam Microphone Keyboard	2
1(b)	Two from: Compilers Linkers Device drivers Operating systems Utilities	2

Question	Answer	Marks																				
2	<table border="1"> <thead> <tr> <th></th> <th>3D</th> <th>Dot matrix</th> <th>Laser</th> </tr> </thead> <tbody> <tr> <td>This printer is an impact printer</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>This printer uses toner</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>This printer uses an inked ribbon</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>This printer uses tomography</td> <td>✓</td> <td></td> <td></td> </tr> </tbody> </table>		3D	Dot matrix	Laser	This printer is an impact printer		✓		This printer uses toner			✓	This printer uses an inked ribbon		✓		This printer uses tomography	✓			4
	3D	Dot matrix	Laser																			
This printer is an impact printer		✓																				
This printer uses toner			✓																			
This printer uses an inked ribbon		✓																				
This printer uses tomography	✓																					

Question	Answer	Marks
3(a)	Two from: Can be more expensive to run if the internet is accessed by mobile data networks Touch screen can be more error prone when typing the data Laptop computers support more file formats Does not have a physical keyboard therefore more difficult to type Has a smaller screen therefore can be more difficult to read	2
3(b)	Two from: Streaming music from the internet Sent by Bluetooth from another device Plugging in an optical device/flash drive/HDD/SSD Downloading music from the cloud Direct input using a microphone Sent by email attachment	2

Question	Answer	Marks
4(a)	Switch	1
4(b)	Hub	1
4(c)	Router	1
4(d)	Bridge	1

Question	Answer	Marks
5	<p>Six from:</p> <ul style="list-style-type: none"> Change default name/usernames and passwords on the router Change the default privacy//use a strong privacy setting Disable features not in use Use strong WiFi encryption Separate the IoT from the home WiFi account Keep software/hardware up to date Avoid public WiFi networks Ensure firewall is operational Use anti-spyware/up to date anti-virus Use strong passwords Use unique passwords for each device Change passwords regularly 	6

Question	Answer	Marks
6	<p>Health problem:</p> <ul style="list-style-type: none"> Award one mark for each problem identified I can reduce Carpel Tunnel Syndrome I can reduce Cubital Tunnel Syndrome I can reduce neck/back pain <p>Strategies:</p> <ul style="list-style-type: none"> Max six strategies Take frequent breaks Use hand exercises Not pressing the keyboard too hard Use software to reduce the pressure on the keys Use voice recognition/microphone Use predictive text//shortcuts Use ergonomic keyboards Use a wrist rest Lift the wrists up when typing Maintain a correct posture 	8

Question	Answer	Marks
7(a)	<p>Two from:</p> <ul style="list-style-type: none"> Menu of different types of cars Shopping basket in which to place bought items Login for username and password Create a customised car Calculates the price Checkout page for creating the order 	2
7(b)	<p>Six from:</p> <p>Benefits:</p> <ul style="list-style-type: none"> Fewer staff/fewer shops therefore reduced overheads/lower costs The company can better target customers Updated more often Cheaper to publicise special offers rather than mail shots More special offers can be offered as lower overheads Broader customer base Operates 24/7 The customer can see immediately if the car is available Can be used from any location Saves cost/time of travelling to the showroom <p>Drawbacks:</p> <ul style="list-style-type: none"> Expensive due to the cost of setting up the website Expensive due to the cost of maintaining the website Expensive due to the need to re-train staff Internet access is needed by the customer Purchasing mistakes can be more easily made Mistakes are more difficult to rectify due to the speed of operation May be difficult to use as help is not as convenient If the system crashes during the purchase the car may not be bought The customer may experience internet/network problems Cannot test drive the car The pictures of the car may not be the same as the actual car <p>To gain full marks there must be at least one benefit and one drawback</p>	6
7(c)	<p>Four from:</p> <ul style="list-style-type: none"> Module testing tests the operation of each module Modules are tested separately Module testing tests the relationships between each module Module testing tests the data passing into and out of the modules Easier to find errors in module testing Whole system testing is carried out after module testing Whole system testing checks that the system works as it is supposed to//matches the user requirements Whole system tests the combined modules 	4

Question	Answer	Marks
8(a)	<p>Max four from:</p> <p>Open spreadsheet Load the file Select B3 to C13 Then hold CTRL and select F3 to F13 Click insert then click bar chart/graph Select the format/type of chart/graph Highlight the chart/graph Copy the bar chart/graph</p> <p>Max four from:</p> <p>Open the presentation software Add a new slide Click on new slide Paste the bar chart/graph Add titles/legend/axes labels Save the file</p>	6
8(b)	<p>Four from:</p> <p>Click on the cell F4 Select formulas Click Autosum/Σ Check the correct range has been highlighted/highlight/drag C4 to E4 Click ✓</p>	4
8(c)	<p>Four from:</p> <p>Highlight B3 to F13 Click Data then Sort Select data has headers Sort by Total/Column F Select Largest to smallest/Descending/Z to A Click OK/enter</p>	4

Question	Answer	Marks
9	<p>Three matched pairs from:</p> <p>Content layer Content can consist of text or images</p> <p>Presentation layer This layer is defined by the CSS or styles to indicate how elements are displayed</p> <p>Behaviour layer This layer of a web page allows interaction</p>	6

Question	Answer	Marks
10(a)	<p>Six from:</p> <p>Name is clearly shown at the top of the data Name must be on a line on its own Information fills the report – Is there a large space at the bottom or side; use professional judgement Suitable title at the top of the page above the name – title must relate academic progress/report Must be a mail merge template or a document, a letter</p> <p>The exact wording must be used for the following Target level All four subjects: Maths, Biology, Chemistry and Physics Attainment and Effort</p>	6
10(b)	<p>Attainment: 1 or 9 Effort: less than 1/greater than 3/decimal number/symbol/text</p>	2
10(c)	<p>Four from:</p> <p>Faster than editing each individual letter Fewer errors than retyping the data More consistency in the reports Error checking only needs to be carried out once on the data and the template Reduces the time taken to type out all the reports separately</p>	4
10(d)	<p>Three from:</p> <p>Click on place where date is to be added Click on Insert field Click on Quick Parts then Field Click on Date Select the format Tick update automatically/automated date Click OK</p>	3

Question	Answer	Marks
11(a)	Sensor	1
11(b)	Digital to Analogue Convertor/DAC	1
11(c)	Actuator/motor	1

Question	Answer	Marks
12	<p>These are points they will need to be expanded upon to gain the mark</p> <p>Six from:</p> <p>Removes freedom of speech International therefore would be difficult to police Laws are different in each country/state The dark net would increase Electronic crimes would move away from the internet to other places, making them harder to intercept Internet users can be anonymous therefore it will be difficult to track down Who chooses what is blocked could affect day to day browsing Concern that everything you do is being watched therefore privacy is lost Could be breaches in sending/receiving confidential/personal data as others could not see it Increase in cost of security Reduction in speed of browsing/search Could lead to corruption/bribery//police may use the data No one owns the internet so it would be impossible to police effectively Very expensive to police the internet as extra police force has to be set up As the internet it so big it is hard to keep track on all the activity As the internet is dynamic it would be impossible to check everything</p>	6

Question	Answer	Marks
13	<p>Four from:</p> <p>Online discussion forum/social platform/website Where the posts are controlled/monitored by an administrator Those that break the rules are banned Filters out inappropriate posts Moderated forums have rules/policy</p>	4

Question	Answer	Marks
14(a)	<p>Two from:</p> <ul style="list-style-type: none"> Could be hardware or software Sits between the computer/network and the router Filters/controls/monitors data/traffic coming in and out of the college network <p>Four from:</p> <ul style="list-style-type: none"> Checks whether the data passing through it meets a given set of rules Blocks data that does not satisfy the rules Alerts user about unwanted data Can log all incoming and outgoing data/traffic to check later Can prevent/block access to undesirable/inappropriate websites/IP addresses Keeps a list of undesirable IP addresses Can prevent hackers gaining access to the system Can send out warnings Can block the unwanted traffic in and out of the network Keeps a list of desirable IP addresses/websites It can block IP addresses 	6
14(b)	<p>Four from:</p> <ul style="list-style-type: none"> Anyone can post information on the internet Websites may contain incorrect information Any information found will need to be checked against reliable sources Similar websites may have conflicting data on the same topic The search engines tend to be generalised Search engines do not necessarily give the most reliable searches at the top of the list//paying to have information at the top of the list Data on the website could be out of date 	4