



# Cambridge IGCSE™

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## INFORMATION & COMMUNICATION TECHNOLOGY

0417/12

Paper 1 Theory

October/November 2023

MARK SCHEME

Maximum Mark: 100

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**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 2023 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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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	Pen drive	1

Question	Answer	Marks
2(a)(i)	<b>One</b> from: <ul style="list-style-type: none"> <li>Continuous data</li> <li>Any values in a range</li> </ul>	1
2(a)(ii)	<b>One</b> from: <ul style="list-style-type: none"> <li>Discrete data</li> <li>Binary</li> </ul>	1
2(b)	<b>One</b> from: <ul style="list-style-type: none"> <li>To control an external device</li> <li>To be sent to an actuator</li> </ul>	1
2(c)(i)	Open the windows in a greenhouse	1
2(c)(ii)	Analogue data	1
2(c)(iii)	Measure acidity levels in a river	1

Question	Answer	Marks
3	<p><b>One</b> mark for a correct network device and <b>one</b> mark for a description of what it does</p> <p>Router <b>One</b> from:</p> <ul style="list-style-type: none"> <li>• Allows a LAN to be connected to a WAN/Internet</li> <li>• A router allows data packets to be sent to LAN/WAN</li> </ul> <p>Hub <b>One</b> from:</p> <ul style="list-style-type: none"> <li>• Connects computers/devices so data can be broadcast to all devices</li> <li>• Expands a LAN</li> <li>• Network interface Card (NIC)</li> <li>• Connect computers/devices to a network</li> </ul> <p>Bridge <b>One</b> from:</p> <ul style="list-style-type: none"> <li>• Connects two LANs of the same protocol together</li> <li>• A bridge creates a single LAN from separate parts</li> </ul> <p>Switch <b>One</b> from:</p> <ul style="list-style-type: none"> <li>• Connects computers together to form a LAN</li> <li>• Allows data to be sent to individual devices</li> </ul>	6

4	<p><b>The validation checks must be different</b></p> <p><b>Book_number</b>  <b>One</b> mark for check and <b>one</b> mark for a description related to the data</p> <p>Length check  Each data item must be exactly 4 characters long</p> <p>Character check  Each data item must be an integer</p> <p>Range check  Data must be in the range 1000 to 9999/1999</p> <p>Presence check  To check that the field has data//not null</p> <p><b>Date_acquired</b>  <b>One</b> mark for check and <b>one</b> mark for a description related to the data</p> <p>Format check  First two numbers followed by a slash then next two numbers followed by a slash then four numbers//DD/MM/YYYY</p> <p>Range check  Checks the date is between two <u>dates</u></p> <p><b>ISBN</b>  <b>One</b> mark for check and <b>one</b> mark for a description related to the data</p> <p>Check digit  The number is checked by calculation of all the separate numbers</p> <p>Character check  Data must be an integer</p>	6
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Question	Answer	Marks
5(a)	<b>Two</b> from: Smartphone and tablet hybrid A tablet that functions as a smartphone It is a device that has the features/properties of a smartphone/tablet computer The device size is in between a smartphone and a tablet	<b>2</b>
5(b)	<b>Six</b> from: <i>Advantages</i> A phablet has a larger screen size so it is easier to read the text/navigate/click on icons/type/edit text Better control over the layout of the screen/newsletter Due to the screen size more people can view at the same time The onscreen keyboard is larger making it easier to enter the data Easier to connect devices onto a phablet  <i>Disadvantages</i> Less portable than a smartphone More difficult to record audio messages due to its size If cameras are to be used then it is easier to use a camera with a smartphone Pupils are more likely to have smartphones with them  <b>To gain full marks the candidate must have both advantages and disadvantages.</b> <b>If only a list then only five marks can be awarded</b>	<b>6</b>

Question	Answer	Marks
6(a)	<b>Two</b> from: Eye problems Headaches Burns	<b>2</b>
6(b)	<b>Two</b> from: Projector falling on the presenter Electrical fire due to overheating of the projector Electrocution caused by liquid spilling on the projector Tripping over trailing cables	<b>2</b>

Question	Answer	Marks
7	<p><b>Two</b> from:</p> <p><i>Advantages</i></p> <p>Safer to use drones than risking the humans filming in the helicopter</p> <p>Cheaper to use a drone rather than using a helicopter</p> <p>The drone could fly closer to the competitors than a helicopter</p> <p>Drones can be used in areas that would not be accessible to the helicopter</p> <p><b>Two</b> from:</p> <p><i>Disadvantages</i></p> <p>More difficult to fix camera problems as no humans present</p> <p>The range of the drone may be smaller</p> <p>The drone may become a distraction as it is closer to the race</p> <p>It can fly out of range and lose control signal</p>	4

Question	Answer	Marks
8(a)	Cloud storage	1
8(b)	Random Access Memory/RAM	1
8(c)	<b>One</b> from: SD/xD/cFast/Memory card Flash memory	1
8(d)	Blu-ray disc	1

Question	Answer	Marks
9	<p>Max <b>two</b> from:</p> <p><i>Validation</i></p> <ul style="list-style-type: none"> <li>• Validation is an automatic computer check</li> <li>• Validation ensures that the data entered is sensible/reasonable</li> <li>• Ensures the data entered fits the set criteria</li> </ul> <p>Max <b>two</b> from:</p> <p><i>Verification</i></p> <ul style="list-style-type: none"> <li>• Verification checks that the data on the original source document is identical to the data that you have entered into the system</li> <li>• Verification ensures that the data is copied/entered correctly</li> </ul> <p>Max <b>three</b> from:</p> <ul style="list-style-type: none"> <li>• Because it is personal data the data needs to be correct</li> <li>• Data should be error free to ensure patients are safe</li> <li>• If data is incorrect it could lead to consequences</li> <li>• Individually they cannot detect all errors</li> </ul>	6



Question	Answer	Marks
10(a)	<p><b>Three</b> from:</p> <ul style="list-style-type: none"> <li>The inputs/processing/outputs of the current system</li> <li>The user requirements for the new system</li> <li>The information requirements for the new system</li> <li>Hardware/software requirements</li> </ul>	<b>3</b>
10(b)	<p><b>Six</b> from:</p> <p><i>Parallel running</i></p> <ul style="list-style-type: none"> <li>Data would need to be entered twice this could cause issues with double booking</li> <li>Staff can be gradually trained on the new system which takes a longer time</li> <li>Parallel running is more expensive to operate as there are two sets of staff/two systems operating</li> <li>In parallel if the new system fails, the old system is still available</li> <li>In parallel running a system is always in place</li> </ul> <p><i>Direct changeover</i></p> <ul style="list-style-type: none"> <li>Faster method of <u>full</u> implementation as the hotel will not want the system to be out of use</li> <li>Immediate benefits</li> <li>System is thoroughly tested before use, therefore less chance of it being faulty</li> <li>Staff have to be trained before the new system is implemented this can be difficult as they are still working</li> <li>Training takes place on non-live systems which may mean problems can be missed</li> <li>Data can be lost as the old system has been removed</li> <li>No system will be in place during the changeover</li> </ul> <p><b>To gain full marks there needs to be both direct changeover and parallel running</b></p>	<b>6</b>
10(c)	<p><b>Five</b> from:</p> <p><i>Benefits</i></p> <ul style="list-style-type: none"> <li>Available 24/7 therefore helps customers to book when they want</li> <li>Fewer problems with the bookings/double bookings</li> <li>Faster booking system as not waiting in queues</li> <li>Immediate confirmation of the booking</li> <li>Easier to cancel/change bookings</li> </ul> <p><i>Drawbacks</i></p> <ul style="list-style-type: none"> <li>Relies on telecommunications to make the booking</li> <li>Needs internet access/connection</li> <li>Security issues due to fraud/others seeing personal data</li> <li>Wrong information may be added accidentally and this may be difficult to correct</li> </ul> <p><b>To gain full marks the candidate must have both benefits and drawbacks</b></p>	<b>5</b>

10(d)	<p><b>Four</b> from:</p> <p><i>WAN</i></p> <ul style="list-style-type: none"> <li>• Wide Area Network</li> <li>• Over a large geographical area</li> <li>• Tends to use satellite technology</li> </ul> <p><i>WLAN</i></p> <ul style="list-style-type: none"> <li>• Wireless Local Area Network</li> <li>• Covers the hotel site</li> <li>• Uses Wireless <u>technology</u></li> </ul> <p><b>To gain full marks the candidate must have both WAN and WLAN</b></p>	<b>4</b>
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Question	Answer	Marks
11(a)	<p><b>Six</b> from:</p> <p><i>Benefits</i></p> <ul style="list-style-type: none"> <li>• Saves the cost of having a store</li> <li>• Saves cost of rent/insurance/utilities/costs/business rates</li> <li>• Saves cost as less staff required</li> <li>• Larger customer base therefore increases profits</li> <li>• The selling is not limited to shop opening hours therefore increases sales</li> </ul> <p><i>Drawbacks</i></p> <ul style="list-style-type: none"> <li>• Increased costs more staff needed to operate/develop the website/drivers</li> <li>• Needs large warehouse space/distribution system</li> <li>• Reliant on the technology</li> <li>• Operates 24/7 therefore increases overheads</li> <li>• Relies on customers that only shop online</li> </ul> <p><b>To gain full marks the candidate must have both benefits and drawbacks</b></p>	<b>6</b>
11(b)	<p><b>Five</b> from:</p> <p>Customer:</p> <ul style="list-style-type: none"> <li>• Loads up the website</li> <li>• Sets up an account</li> <li>• Logs into the website</li> <li>• Enters a password</li> <li>• Browses through the online catalogue</li> <li>• Clicks on the items required</li> <li>• Enters the quantity/colours/size of items</li> <li>• Adds items to the virtual basket/cart</li> <li>• Clicks on the virtual checkout</li> <li>• Chooses payment method</li> <li>• Chooses delivery method</li> <li>• Adds payment/delivery/personal details</li> <li>• Checks the details entered</li> <li>• Logs out of system</li> </ul>	<b>5</b>

Question	Answer	Marks
12(a)	<p><b>Four</b> from:</p> <ul style="list-style-type: none"> <li>• Clear and visible labels for each field</li> <li>• Font size is large enough to read</li> <li>• Easy data entry</li> <li>• Language used is simple to understand</li> <li>• Appropriate size of data entry sections</li> <li>• Good use of white space//Fills the screen</li> <li>• Use of sensible error messages</li> <li>• Use of navigation buttons/drop down boxes/radio buttons</li> <li>• Use/location of Help buttons/instructions</li> </ul>	<b>4</b>
12(b)	<p><b>Two</b> from: <b>Only allow the first two answers and then place a MAX</b></p> <ul style="list-style-type: none"> <li>• Buttons are large enough to see</li> <li>• Font size is large enough to read</li> <li>• Use of high contrast colours</li> <li>• Use of voice entry</li> <li>• Use of text to speech</li> </ul>	<b>2</b>