



# Cambridge IGCSE™

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INFORMATION AND COMMUNICATION TECHNOLOGY

0417/12

Paper 1 Theory

February/March 2021

MARK SCHEME

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**FINAL**

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This document consists of **15** 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.

Qn	Answer	Marks															
1	<table border="1"> <thead> <tr> <th></th> <th>internal</th> <th>external</th> </tr> </thead> <tbody> <tr> <td>Mouse</td> <td></td> <td>✓</td> </tr> <tr> <td>Video card</td> <td>✓</td> <td></td> </tr> <tr> <td>Printer</td> <td></td> <td>✓</td> </tr> <tr> <td>Actuator</td> <td></td> <td>✓</td> </tr> </tbody> </table> <p>2 marks for 4 correct ticks 1 mark for 2 or 3 correct ticks 0 marks for 0 or 1 tick</p>		internal	external	Mouse		✓	Video card	✓		Printer		✓	Actuator		✓	2
	internal	external															
Mouse		✓															
Video card	✓																
Printer		✓															
Actuator		✓															
2	<p><b>Three</b> from: Ergonomic keyboard Ergonomic mouse Microphone Wrist rest</p>	3															
3(a)	<p><b>Four</b> from: Bold on date Superscript on the date Left aligned on date Fully justified Text/word wrap Highlighted text Italics</p>	4															

Qn	Answer	Marks
3(b)	<p><b>Six</b> from:</p> <ul style="list-style-type: none"> <li>Plug in/bluetooth the digital camera to the computer//Plug in the SD card/memory card</li> <li>Select the image to be uploaded</li> <li>Upload the image to the computer</li> <li>Save the image on the computer</li>   <li>Load/open the word processing software</li> <li>Load the diary entry file</li> <li>Place the cursor where you want the image to be</li> <li>Click insert...image</li> <li>Choose/find/browse the image from the folder</li> <li>Insert the image in the text</li>   <li>Reformat/resize/crop the image</li> <li>Reposition/place the image</li> <li>Click word wrap/text wrap</li> <li>Save the document</li> </ul>	<b>6</b>
3(c)	<p><b>Two</b> from:</p> <ul style="list-style-type: none"> <li>Internet</li> <li>Scanned images</li> <li>Images stored on: Smart phone/Mobile phone/PC/Tablet/SD card/Smartwatch</li> <li>Clipart libraries</li> <li>Screenshot</li> </ul>	<b>2</b>

Qn	Answer				Marks
3(d)		jpg	png	gif	4
This file type stores still or moving images			✓		
This file type uses lossy compression	✓				
This file type is used for storing photographs on a digital camera	✓				
This file type is limited to 256 colours			✓		
3(e)	<p>Max <b>two</b> from: It is an area of a document on <u>every</u> page At the top of a page The area is between the top of the page and the top of the margin</p> <p>Max <b>two</b> from To show consistency on each page To ensure that each page has the same data in the header Saves time for the author typing out the data on each page</p>				4

Qn	Answer	Marks
4(a)	<p><b>Six</b> from:</p> <ul style="list-style-type: none"> <li>Different size/style of font for the title/features in the table</li> <li>Clear font colour for the title/text in the table</li> <li>Clear fonts for the title/text in the table</li> <li>Use of bold to highlight keywords</li> <li>Use of italics to highlight keywords</li> <li>Poster fills the page</li> <li>Data is shown in the comparison table/chart</li> <li>More text than images</li> <li>Contrasting colours for font and background colour</li> <li>Use of white space</li> <li>Use of borders to make the text stand out</li> </ul>	<b>6</b>
4(b)	<p><b>Four</b> from:</p> <ul style="list-style-type: none"> <li>The data is sent to/read by the microprocessor</li> <li>The data is stored by the tracker</li> <li>Convert the raw data into blood pressure data</li> <li>Compare the data with pre-set values</li> <li>If out of range <u>send data</u> to an alert system</li> <li>The data is <u>sent to</u> the screen</li> </ul>	<b>4</b>

Qn	Answer	Marks	Notes
5(a)	<b>Two</b> from: Internet etiquette Set of social conventions They show common courtesy when communicating online	2	Allow set of rules for social conventions  Allow good behaviour for common courtesy
5(b)	<b>Four</b> from: Do not use capital letters as it relates to shouting Do not use abusive/vulgar language/threatening behaviour Be clear in the text sent Always check spelling and grammar Remember that sarcasm does not communicate well Respect other's privacy Respect other people's views Do not use too many emoticons Do not use text language/slang Do not spam Do not send inappropriate links	4	Remember the question is about texting
6(a)	an RFID reader	1	Do not allow chip reader as this may not be contactless
6(b)	OCR	1	
6(c)	a bar code reader	1	

Qn	Answer	Marks	Notes
7(a)	<p><b>Six from:</b></p> <p><i>Benefits</i></p> <p>Fast throughput of pupils at the tills</p> <p>Fast transaction (as only the card is presented)</p> <p>If the card is stolen it can be blocked</p> <p>One card is less bulky than money</p> <p>(Using the card) is more secure because the money can only be used in the canteen</p> <p><i>Drawbacks</i></p> <p>Tendency to spend more as it is a card</p> <p>Difficult to keep track of your spending (as no physical money)</p> <p>If the card is damaged/lost the pupil cannot buy food/lose all their money</p> <p>Card needs topping up regularly</p> <p>Cards will need to be purchased by the pupils and can be expensive</p> <p>Parents can see what the pupils buy</p> <p>If there is an issue with the machine not easy to see mistakes</p> <p>Easier to misplace than cash/coins</p> <p>Parents can limit how much is spent on food</p> <p>Pupils can only spend the money in the canteen and on food</p> <p><b>To gain full marks there must be at least one benefit and at least one drawback</b></p>	6	Do not allow easily lost as cash can be lost

Qn	Answer	Marks	Notes
7(b)	<p><b>Six</b> from:</p> <p>The cost of the meal is totalled  The reader <u>reads the details</u> from the card  The amount of money on the card is checked  The total is compared to the amount of money on the card  If it is greater the transaction is rejected  If it is less than or equal to then the transaction is accepted  Checked whether card it is correct type/stolen/blocked  The cost is deducted from the amount on the card  The amount/total balance on the card is updated (following transaction)  The amount is credited to the school system  The details of the receipt are prepared//The receipt is produced//Rejection slip is produced//Message is prepared</p>	6	<p>Allow one mark for transferring money from the card to the school system, this is instead of deducted from the card and credited to the school system</p> <p>Do not accept anything about banks/<b>account</b>.</p> <p>Allow receipt is printed for a BOD</p>
8(a)	<p><b>One</b> from</p> <p>Highlight cells A4 to B10  Click anywhere in the range  Highlight A4 to A10 and click expand the selection  Highlight B4 to B10 and click expand the selection</p> <p><b>Two</b> from</p> <p>Click on the down arrow//Click on (Custom) Sort  Select column B  Select smallest to largest/A ↓ Z</p>	3	<p>If it works then it is correct. There may be alternatives</p> <p>Allow A3 as part of the range  Allow Select A3 to B3</p> <p>Ascending is in the question</p>

Qn	Answer	Marks	Notes
8(b)	<p><b>Three</b> from: Totals cells B5 to B9//Totals the scores Multiplies by cell D1/difficulty/3.4 Rounds the value to 1 decimal place</p>	3	
8(c)	<p>Matched pairs Abnormal – data that is outside the range//Unacceptable data//Data of the wrong type Example: greater than 10, negative numbers, letters, symbols</p> <p>Extreme – data that is on the boundary of acceptability Example: 10</p>	4	Accept 1 or 0 for lower boundary of extreme data. Any others contact lan

Qn	Answer	Marks	Notes
9(a)	<p><b>Six</b> from:</p> <p>OMR sheets are scanned in using an optical mark reader//Reader reads the lozenge</p> <p>Data is sent to the computer</p> <p>A template of the register is loaded into the computer</p> <p>A value is assigned to each lozenge</p> <p>A light passes through the scanner and shows position of each filled in lozenge//Comparing dark spots with lighter areas//Use X Y coordinates</p> <p>The position is compared to the template/pre-determined data</p> <p>If the lozenge shaded is [P] then the pupil is recorded as present</p> <p>If the lozenge shaded is [A] then the pupil is recorded as absent</p> <p>If both lozenges [A] and [P] are shaded then the pupil is recorded as late.</p> <p>If no lozenge on a line is shaded the result is discarded</p>	6	<p>Allow position is noted by the system</p> <p>Allow mark is recorded for last four points</p>

Qn	Answer	Marks	Notes
9(b)	<p><b>Eight</b> from:</p> <p><i>Advantages</i>            Faces are unique therefore greater security            Data entry is faster (as it does not need to be sent to the office for entry)            Data entry is more accurate (the teacher could enter the wrong data)            Greater security as the pupil needs to be present to register            More difficult to fake biometrics            OMR data sheets can be forgotten or lost</p> <p><i>Disadvantages</i>            Facial injuries/facial hair/glasses/(masks) can affect the data entry            The cost of setting up a new system is higher as extra hardware and software needs to be purchased//Setting up the system is (more) expensive            Time consuming to set up all the pupils            The data will need to be updated regularly due to facial changes as pupils get older            Higher error rate            System is more complex therefore may cost more to maintain//Maintaining the system is (more) expensive            The environment and usage may affect the reader            Biometric systems are not 100% accurate            Less flexibility as the OMR sheets can be used anywhere in the school            Biometric data harder be reset if incorrect/if change needed            Greater invasion of privacy as data has to be stored on the computer</p> <p><b>To gain full marks there must be at least one advantage and one disadvantage</b></p>	8	

Qn	Answer	Marks	Notes
9(c)	<p><b>Two</b> from: Name Address Gender Date of birth <u>Personal</u> contact details (Email address, phone number) ID card/roll number Race//Ethnic origin</p>	2	<p>There will be others</p> <p>Do not allow biometrics</p> <p>Allow Caste/religion</p>
10(a)	<p><b>Two</b> from: Data is stored on offsite servers Many servers in many locations Data is stored on more than one server Uses data redundancy Cloud is an <u>online</u> service/data storage</p> <p><b>Two</b> from: Advantage The cloud has greater storage capacity than other methods The data could be sent directly to the cloud (from any device) Access the data from any device/anywhere Easier to add storage capacity Lower capital outlay The owner would only pay for the storage they used Backup up tends to be automatic Cloud is more robust Cloud is more secure (as it is passworded)</p>	4	

Qn	Answer				Marks	Notes																				
10(b)	<table border="1"> <thead> <tr> <th></th> <th>optical</th> <th>magnetic</th> <th>solid state</th> </tr> </thead> <tbody> <tr> <td>Flash drive</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>Hard disk drive</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>Blu-ray disc drive</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>SSD</td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table>					optical	magnetic	solid state	Flash drive			✓	Hard disk drive		✓		Blu-ray disc drive	✓			SSD			✓	4	If two ticks are on one line then X
	optical	magnetic	solid state																							
Flash drive			✓																							
Hard disk drive		✓																								
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11	<p><b>Check the page before for answers</b></p> <p>Max <b>two</b> examples, for each example</p> <p>1 mark for a <u>correct</u> field names (and data examples) 1 mark for the reason</p> <p>Matched pairs Type of book Can use length/lookup check as only one letter is input for example E or H Cannot use a type check as only one letter used</p> <p>ISBN Can use check digit as a way of checking that digits are not transposed Cannot use a length check as they are different lengths</p> <p>Date of purchase Can use a format check as all dates are the same format.</p> <p>Number of copies Can use a range/limit check as the lowest number is 1 Can use a type check as only numbers are accepted</p> <p>Name of book/Name of Book Cannot use a length check as names can be any length Cannot use a type check as any character can be used</p> <p>Name of author Cannot use a length check as names can be any length</p>	4	<p>Field names:</p> <p>Name of book, Name of author, ISBN, Date of purchase, Number of copies, Type of book</p> <p>Apart from Name of book the field names must be exact</p> <p>Allow The validation checks must be appropriate otherwise invalid data would be accepted – 1 mark</p> <p>Checks the data entered is sensible – 1 mark</p> <p>Allow FT for misspelt field name</p> <p>Allow presence check for Name of book or Type of book include reason</p> <p>Do not allow character check</p>

Qn	Answer	Marks	Notes
12	<p><b>Six from:</b> Benefits Monitors traffic into and out of the network to make sure that all data passing is safe. Checks whether the data passing through it meets a given set of rules... ...if they do not then the data is blocked Can block the unwanted traffic in and out of the network It can log all incoming and outgoing traffic to check later Can block certain undesirable websites/IP addresses Keeps a list of desirable IP addresses/websites It can block IP addresses to stop hackers</p> <p>Drawbacks It cannot stop individuals, on internal networks, by-passing the firewall It cannot stop employees hacking the computer from within the system Users own devices can by-pass the firewall therefore meaning the computer/network is in danger It cannot stop hackers only devices that hackers are using</p> <p><b>To gain full marks on the question at least one benefit and drawback are needed</b></p>	6	<p>Allow Sends warnings to users about unsafe sites/data</p> <p>Allow port for block IP addresses</p> <p>Allow filtering incoming data for monitors in first mark point</p>