



# Cambridge IGCSE™

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INFORMATION AND COMMUNICATION TECHNOLOGY

0417/01

Paper 1 Theory

For examination from 2020

MARK SCHEME

Maximum Mark: 100

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Specimen

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This document has **10** pages. Blank pages are indicated.

**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)	Laser printer Buzzer	2
1(b)	DVD RAM Blu-ray disc	2

Question	Answer	Marks																				
2	<table border="1"> <thead> <tr> <th></th> <th>abnormal (✓)</th> <th>normal (✓)</th> <th>extreme (✓)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>45</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>100</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>110</td> <td>✓</td> <td></td> <td></td> </tr> </tbody> </table>		abnormal (✓)	normal (✓)	extreme (✓)	0			✓	45		✓		100			✓	110	✓			4
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3(a)	<table border="1"> <thead> <tr> <th></th> <th>Content layer (✓)</th> <th>Presentation layer (✓)</th> <th>Behaviour layer (✓)</th> </tr> </thead> <tbody> <tr> <td>This layer is used to format elements within a web page.</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>This layer is used to create the structure of a web page.</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>This layer is used to enter scripting language to elements within a web page.</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>This layer is defined by cascading style sheets.</td> <td></td> <td>✓</td> <td></td> </tr> </tbody> </table>		Content layer (✓)	Presentation layer (✓)	Behaviour layer (✓)	This layer is used to format elements within a web page.		✓		This layer is used to create the structure of a web page.	✓			This layer is used to enter scripting language to elements within a web page.			✓	This layer is defined by cascading style sheets.		✓		4
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3(b)	<p><b>Two</b> from</p> <p>Request made by entering a web address/URL or clicking a link</p> <p>Retrieves code from the server/resources downloaded</p> <p>Interprets the code as a web page/uses page resources to build the web page</p> <p>The web page is <u>displayed</u>/renders page to view</p>	2																				
3(c)	<p><b>HTTP</b></p> <p><b>Two</b> from</p> <p>Hypertext Transfer Protocol</p> <p>A method of accessing data over the internet</p> <p>Sets the rules of formatting and transmitting messages</p> <p>Used by the World Wide Web</p> <p><b>ISP</b></p> <p><b>Two</b> from</p> <p>Internet Service Provider</p> <p>Allows users to access the internet</p> <p>Provides services such as domain name registration and web hosting</p>	4																				

Question	Answer	Marks
4(a)	<p><b>Four</b> from, for example</p> <ul style="list-style-type: none"> <li>Purpose of the system/program</li> <li>Limitations of the system</li> <li>Program listing</li> <li>Program language</li> <li>Program flowcharts/algorithms</li> <li>System flowcharts</li> <li>Hardware requirements</li> <li>Software requirements</li> <li>File structures</li> <li>List of variables</li> <li>Input format</li> <li>Output format</li> <li>Sample runs/test runs</li> <li>Validation routines</li> </ul>	<b>4</b>
4(b)	<p><b>Two</b> from</p> <ul style="list-style-type: none"> <li>Purpose of the system</li> <li>Limitations of the system</li> <li>Hardware and software requirements</li> <li>How to load/run/install software</li> <li>How to save a file</li> <li>How to print data</li> <li>How to add records</li> <li>How to delete/edit records</li> <li>Input format</li> <li>Output format</li> <li>Sample runs</li> <li>Error messages</li> <li>Error handling</li> <li>Troubleshooting guide/helpline</li> <li>Frequently asked questions</li> <li>Glossary of terms</li> </ul>	<b>2</b>

Question	Answer	Marks
5(a)	<p><b>Four</b> from</p> <ul style="list-style-type: none"> <li>Camera takes an image of the number plate/(front of the) vehicle</li> <li>Saves the image</li> <li>Software determines where on the image the number plate is</li> <li>Converts the image to text</li> <li>Conversion uses OCR/optical character recognition</li> <li>Saves/stores the text</li> <li>Compares the text with data saved in the database</li> <li>Confirms the driver is visiting the company</li> </ul>	<b>4</b>

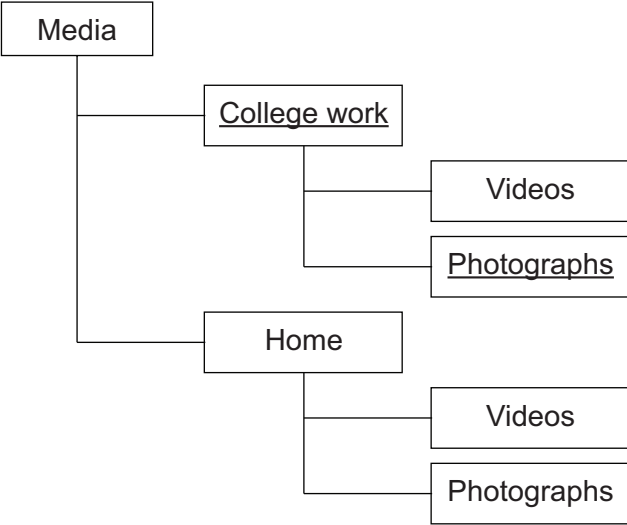
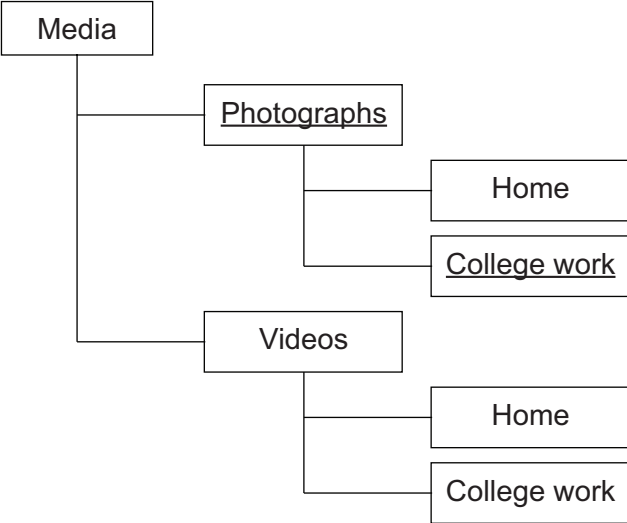
Question	Answer	Marks
5(b)	<p><b>Six</b> from <b>Comparisons</b> Both are direct data entry systems Both are used to communicate with the reader</p> <p><b>Contrasts</b> Max <b>five</b> from RFID chips can be read from a greater distance/bar codes need to be closer to the reader Bar codes need to be in line of sight with the reader/RFID chips do not need to be RFID chips can be uploaded easier/bar codes require a brand new code RFID chips read at a faster rate RFID chips are more useable/more robust RFID chips are more secure</p>	<b>6</b>

Question	Answer	Marks
6(a)(i)	<p>Department <b>One</b> from Length check Type check</p>	<b>1</b>
6(a)(ii)	<p>Date_of_birth <b>One</b> from Length check Format check</p>	<b>1</b>
6(a)(iii)	<p>Year_left <b>One</b> from Length check Range check Type check</p>	<b>1</b>
6(b)	<p><b>Two</b> from The field would not be used for calculations There is a leading zero in the data Text fields take up less space than numeric fields</p>	<b>2</b>
6(c)	<p>Award <b>one</b> mark for four field names given Award <b>one</b> mark for the <u>other</u> two field names Appropriate alternative names can be used</p> <p>Max <b>six</b> from Data fill the screen and it looks like an online form Use of navigation buttons Use of drop down lists for year_left or department Use of text/character boxes The name fields are larger than the year_left, date_of_birth and department Use of a calendar for date_of_birth Use of submit/help buttons Appropriate title</p>	<b>8</b>

Question	Answer	Marks
7	<p><b>Four</b> from</p> <ul style="list-style-type: none"> <li>Monitors and controls incoming and outgoing data traffic</li> <li>Helps to prevent malware being downloaded</li> <li>Prevents computer accessing undesirable/unauthorised sites</li> <li>Prevents unauthorised users accessing the computer</li> <li>Keeps a list of undesirable sites/IP addresses</li> <li>Keeps a list of acceptable sites/IP addresses</li> <li>Warns you of threats</li> <li>Allows you to accept/reject downloaded programs</li> </ul>	<b>4</b>

Question	Answer	Marks
8(a)	<p>Max <b>five</b> from</p> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>Can call meetings at short notice</li> <li>Employees save time travelling</li> <li>No hotel expenses</li> <li>Safer as participants do not have to travel</li> <li>No need to transport/carry equipment/lots of documents</li> <li>No risk of losing documents in transit</li> </ul> <p>Max <b>five</b> from</p> <p><b>Drawbacks</b></p> <ul style="list-style-type: none"> <li>Takes time/costs money to learn new technology/to be trained</li> <li>Difficult to have international meetings because of time differences</li> <li>Initial cost of hardware (and software)</li> <li>Equipment can break down/power cuts can stop conference</li> <li>Poor strength of signal/time lag/lip sync can be a problem/connection can be lost</li> <li>Loss of personal/social contact</li> <li>Legal documents cannot be signed</li> </ul> <p>A mark can be awarded for a reasoned conclusion</p>	<b>8</b>
8(b)	<p><b>Three</b> from</p> <ul style="list-style-type: none"> <li>Router</li> <li>Web cam</li> <li>Microphone</li> <li>Network card</li> <li>Speakers</li> <li>Large monitor/data projector</li> <li>Codecs</li> </ul>	<b>3</b>

Question	Answer	Marks
9(a)	Crop	<b>1</b>
9(b)	<p><b>Two</b> from</p> <ul style="list-style-type: none"> <li>Clicked on the image/selected the image</li> <li>Select format (menu)</li> <li>Click on crop (button)</li> <li>Removed the unwanted elements</li> </ul>	<b>2</b>

Question	Answer	Marks
9(c)	<div style="text-align: center;">  <pre> graph TD     Media[Media] --- CW[College work]     Media --- Home[Home]     CW --- CW_V[Videos]     CW --- CW_P[Photographs]     Home --- Home_V[Videos]     Home --- Home_P[Photographs]                     </pre> </div> <p><b>OR</b></p> <p>In Home section: level 2 can be in any order</p> <div style="text-align: center;">  <pre> graph TD     Media[Media] --- P[Photographs]     Media --- Videos[Videos]     P --- P_H[Home]     P --- P_CW[College work]     Videos --- V_H[Home]     Videos --- V_CW[College work]                     </pre> </div> <p>In Videos section: level 2 can be in any order</p> <p><b>One</b> mark for level 1  <b>One</b> mark for level 2  <b>One</b> mark for College work and Photographs in correct place</p>	<b>3</b>

Question	Answer	Marks
10(a)	<p>HLOOKUP(B4, D1:K2,2)</p> <p>The formula looks for the value in B4                      Searches for it in the range/table array (D1:K2)                      Then displays the corresponding result                      From row two/second row of the range</p>	<b>3</b>

Question	Answer	Marks
10(b)	<p>Max <b>two</b> from \$ signs missed out from the table array/D1:K2 When the formula was replicated ... ... the table array cell references are changed \$ signs lock the range</p> <p><b>One</b> from He could highlight the table array and name the range</p>	<b>3</b>

Question	Answer	Marks
11	<p><b>Four</b> advantages from</p> <p>GUI allows the use of pinching, scrolling and expanding but CLI does not allow this Icons speed up finding instructions, with CLI you have to type out the commands in full GUI is more visual therefore finding commands is quicker If a mistake is made in CLI it could have major consequences whereas in GUI a mistake has less impact GUI allows more multi-tasking GUI is faster to operate and more efficient as it uses a finger/stylus rather than a keyboard GUI is more user friendly; with CLI the commands have to be memorised In CLI several commands have to be typed in rather than one command in GUI GUI has more system resources Easier to remote access with GUI Fewer health problems ... ... eye strain, carpal tunnel syndrome</p>	<b>4</b>

Question	Answer	Marks
12(a)	<p><b>Six</b> from</p> <p>Some workers may job-share with other workers ... ... this means that two workers share the same job one starting as the other finishes Some workers may work compressed hours ... ... this means working a five-day week but compressed to four days Some workers may work flexible hours ... ... the worker and the employer negotiate a time the employee works ... this means the employee can arrive later/leave later as long as they work the set number of hours Workers can change their work pattern to meet domestic chores/avoid rush hour Some workers can work from home</p>	<b>6</b>



Question	Answer	Marks
12(b)	<p><b>Looking at a monitor for a long period of time</b></p> <p><u>Health problem</u> <b>One</b> from Eye strain/headache/dry eyes/eye problems</p> <p><u>Possible solution</u> <b>Two</b> from Resting the eyes by looking in the distance/taking regular breaks Cutting down on glare Making sure the screen is at eye level Using blue screen technology Using flat screen technology Using (blue) glasses Using anti-flicker screen Reducing the brightness of the screen</p> <p><b>Sitting too close to the office laser printer</b></p> <p><u>Health problem</u> <b>One</b> from Ozone irritation/dry skin/respiratory problems</p> <p><u>Possible solution</u> <b>Two</b> from Proper room ventilation/use of fans Laser printers should be housed in a dedicated printer room Changing to other forms of printer</p>	<b>6</b>

Question	Answer	Marks
13	<p>Award <b>one</b> mark for <i>Visual verification</i> Visually comparing typed in data with original source</p> <p>Award <b>one</b> mark for <i>Double data entry</i> Computer compares two versions of the typed in data</p> <p><b>Two</b> from To check that data has been entered/copied accurately To check to ensure accurate data entry Validation may not pick up that although the data is acceptable it may still be incorrect</p>	<b>4</b>

Question	Answer	Marks
14	<p><b>Advantages</b>  Max <b>four</b> from  More secure  MICR characters cannot be read electronically after being photocopied  MICR characters are difficult to forge  Can be read even if the writing is written on/paper folded  More accurate in reading  Data is read faster  Characters cannot be changed once printed</p> <p><b>Disadvantages</b>  Max <b>four</b> from  Requires a specialist reader which are expensive  More expensive to produce the writing  Limited number of characters  Cannot be read by standard smartphones  Limited number of characters</p> <p>One mark available for a reasoned conclusion</p>	<b>6</b>