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**INFORMATION AND COMMUNICATION TECHNOLOGY**

**0417/12**

Paper 1 Written Paper

**March 2019**

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 March 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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		<b>WAN</b> (✓)	<b>WLAN</b> (✓)	<b>LAN</b> (✓)	4
	A cabled network used in one building.			✓	
	The internet is an example of this type of network.	✓			
	Several networks connected together using a router.	✓			
	This network is connected without cables.		✓		

Question	Answer		Marks	
2		<b>System Software</b> (✓)	<b>Applications Software</b> (✓)	2
	Compiler	✓		
	Word processing software		✓	
	Spreadsheet software		✓	
	Operating system	✓		
4 correct ticks – 2 marks 2 or 3 correct ticks – 1 mark 1 correct tick – 0 marks				

Question	Answer	Marks
3	<b>Two</b> from: The user does not have to learn/remember commands More user friendly Can be used on more devices e.g. smartphones A mouse/finger can be used to select icons Using a mouse/finger is simpler than typing in commands Fewer errors are made than typing in commands	2

Question	Answer	Marks
4	<p><b>Three</b> from:</p> <p>Inspects the data packets received            Checks the destination IP address...            ...using the stored routing table            It uses a routing table which lists all the different routes to other networks            Uses the IP address to work out the best route...            ...sends the data packet to the next router</p>	3

Question	Answer	Marks
5	<p>A virus is a piece of software/program code – 1 mark</p> <p><b>One</b> from:</p> <p>It infects a computer            Attaches itself to files            Has the ability to replicate itself</p>	2

Question	Answer	Marks
6	<p>Buzzer            LCD monitor            Speaker</p>	3

Question	Answer	Marks
7(a)	<p>VLOOKUP(B2,Products!A\$2:C\$11,3,False)*C2</p> <p>1 mark for correct function VLOOKUP()            1 mark (B2,            1 mark Products!            1 mark for A2:C11            1 mark for correct use of \$            1 mark for ,3            1 mark for ,False)            1 mark for *C2</p> <p>All elements must be in the correct order</p>	8
7(b)	<p><b>Three</b> from:</p> <p>Highlight E2:E7            Select format cells            Select currency/accounting            Select ₹            Select 0 decimal places</p>	3

Question	Answer	Marks
8(a)(i)	joystick	1
8(a)(ii)	video camera	1
8(a)(iii)	monitor	1
8(b)	<p><b>Three</b> from:            Data is continuously sent back to the operator/whereas a person would collect it and send it back            The drone can work in hazardous conditions            Drones get a wider view of the flood            Can go where people cannot</p>	3

Question	Answer	Marks
9	<p>&lt;/head&gt; is in the wrong place // &lt;title&gt;...&lt;/title&gt; line is in the wrong place            &lt;tbody style="background-color: #9acd32"&gt; no ending quotes            scr is not correct syntax should be src            final &lt;table&gt; is not correct should be &lt;/table&gt;</p>	4

Question	Answer	Marks
10(a)	<p><i>Similarities</i>            Both used for transactions            Both are portable            Both allow payment at point of use</p> <p>Max <b>five</b> from:  <i>Differences</i>            Faster process/reading using the card            Someone needs to check correct payment made with cash/card is automatically checked            May not have enough money on the card and may not know this            When the money has run out on the card it cannot be used until it is topped up            Card details can be used for statistics to plan for use for the bus journey/times            A card can be blocked when stolen            More security in place if the card gets stolen            Sometimes you need the correct cash amount/no change given            More likely to have cash in your pocket            If you pay by cash you know how much you have paid/no double payment            No physical cash with a card so less chance of stealing by employees</p>	6
10(b)	<p><b>One</b> from:            Nitrogen oxide (sensor)            Light (sensor)            Gas (sensor)            CO<sub>2</sub> (sensor)            pH (sensor)</p>	1

Question	Answer	Marks
10(c)	<p><b>Four</b> from:</p> <p>The microprocessor has a stored value/preset                      Data from the sensor is compared with the preset value                      If the reading is higher than the preset value                      Microprocessor sends signal to the street sign                      If the reading is lower than the preset value nothing happens / if warning sign is lit; it is switched off</p>	<b>4</b>
10(d)	<p><b>Two</b> from:</p> <p>Sensor only reads analogue data                      Microprocessor only reads digital data</p>	<b>2</b>

Question	Answer	Marks
11	<p>The diagram illustrates the engineering design process as a continuous cycle of four stages: Evaluation, Design, Implementation, and Documentation. These stages are arranged in a circle and connected by blue arrows pointing clockwise. The transition from Evaluation to Design is labeled 'Analysis', and the transition from Design to Implementation is labeled 'Development and Testing'. To the right of the cycle, a rectangular box contains the following list of stages: Design, Implementation, Documentation, and Evaluation.</p>	<b>4</b>

Question	Answer	Marks
12(a)	<p>Max <b>three</b> from:</p> <p><i>Advantages</i></p> <p>Benefits are immediate whereas in parallel it takes time to fully implement            Costs are reduced as there is only one system to maintain but in parallel there are two systems and two sets of workers            Less likelihood of bugs as the system will have been fully tested            Data only needs to be entered into one system but with parallel running data has to be entered into two systems therefore is more time consuming</p> <p>Max <b>three</b> from:</p> <p><i>Disadvantages</i></p> <p>If the system fails there is no backup but in parallel running if the system fails then the old system is still operational//risk of loss of data            Staff have to be trained on the new system as it is implemented with parallel it is possible to train staff gradually.</p> <p>Method chosen: Direct Changeover and max <b>two</b> from:</p> <p>Max <b>two</b> from:</p> <p>The system will be <u>fully</u> implemented faster than with parallel running            There could be data clashes/inconsistencies with two systems operating at the same time            Data would be duplicated            The school is dealing with external agencies and therefore need single output to these agencies            Fewer staff in a school to run two systems</p>	<b>8</b>
12(b)	<p><b>Four</b> from:</p> <p>Quicker to find clashes within the timetable            Quicker to find the data needed for the timetable            Less error prone            What ... If scenarios can be set up            The data in the timetabling system can be used in other applications <u>automatically</u>            Quicker to make changes and print timetables</p>	<b>4</b>

Question	Answer	Marks
13	<p><b>Four</b> from:</p> <p>(Both) hand is scanned (using CT or MRI scanners or X-ray)            A 3D digital copy is made of the injured areas/hand            The digital copy is loaded into the software            (Software) slices the model into hundreds of layers            3D printer creates the new hand/prosthetic layer by layer            Uses plastic/resin            The printer binds the layers together            The new hand/prosthetic is compared to his other hand            Re-printed if necessary            The 3D printer prints the final version</p>	<b>4</b>

Question	Answer	Marks
14(a)	<p><b>Four</b> from:</p> <ul style="list-style-type: none"> <li>Scrambling/encoding of data</li> <li>Uses encryption software/encryption key</li> <li>Requires a decryption/encryption key to unscramble</li> <li>Meaningless to the hacker</li> <li>Secures data being transferred from computer to computer</li> <li>Protects sensitive data/prevents personal/confidential data falling into wrong hands</li> </ul>	<b>4</b>
14(b)	<p><b>One</b> from:</p> <ul style="list-style-type: none"> <li>Use of user name and <u>strong</u> password</li> <li>Biometrics</li> <li>Use of a dongle</li> <li>Physical locks</li> <li>Firewall</li> </ul>	<b>1</b>

Question	Answer	Marks
15	<p><b>Four</b> max from:</p> <ul style="list-style-type: none"> <li>Allows the user to model and analyse data according to location</li> <li>Allows users to create interactive queries</li> <li>Spatial awareness/see how images fit together in space</li> <li>Edit map data</li> <li>Combines maps, graphics and databases</li> <li>Layers a map with other data</li> <li>Works with GPS</li> </ul> <p><b>Examples</b></p> <p><b>One</b> from, for example:</p> <ul style="list-style-type: none"> <li>Emergency services can use it to find fire hydrants/other emergency vehicles</li> <li>Protection of animal life in certain areas/flood regions</li> <li>Maps landmarks</li> <li>Teachers use it in Geography/Science/engineering lessons</li> <li>Prospecting oil</li> <li>Maps sites that produce pollution</li> </ul>	<b>5</b>



Question	Answer	Marks
16(a)	<p>Max <b>two</b> marks, for example:            The audience could be young            The audience may be teenagers            The audience may be old</p> <p>Max <b>three</b> from:            The solution must match the age of the audience            More images, sounds, interactive with younger            More words for the older/adults            The audience experience may be greater            More content is needed for younger people to those who are older            Expectations from the audience may be different            An audience of experts would expect more from a solution            More explanation needed from someone who is not an expert</p>	<b>4</b>
16(b)	<p><b>Four</b> from:            Unique reference number/product key needs to be entered when the product is first installed...            ...the system will check for duplicated numbers            Only runs with CD-ROM/memory stick attached...            ...parts of the software are stored on the memory stick/CD-ROM            Dongle needs to be attached...            ...parts of the software are stored on the dongle</p>	<b>4</b>

Question	Answer	Marks
17(a)	<p>Damage to fingers/wrists            Caused by continuous use of keyboards/clicking of mouse buttons/texting/constant use of mouse</p>	<b>2</b>
17(b)	<p><b>Two</b> from:            Ensure correct position of the arms/hands            Use a wrist rest/mouse rest            Regular breaks            Use ergonomic keyboards/mice            Use voice activated software</p>	<b>2</b>

Question	Answer	Marks
18	<p>To be marked as a level of response:</p> <p>Award a mark for each benefit or drawback but follow the rules below</p> <p>Level 3 (7–8 marks): To gain a level 3 there must be a reasoned conclusion and a justification and achieved all of level 2 Award a mark for good justification of one of the points raised Award a mark for a reasoned conclusion</p> <p>Level 2 (4–6 marks): For level 2 there must be benefits and drawbacks and achieved all of Level 1</p> <p>Level 1 (1–3 marks): For level 1 there must be benefits <u>or</u> drawbacks up to three</p> <p>Level 0 (0 marks): Response with no valid content</p> <p><i>Answers may make reference to e.g.:</i></p> <p><b>Drawbacks</b> Distractions when using the phone Battery life can be short so needs regular re-charging Re-charging sockets may be different Cost of international use can be high Need a phone plan/phone that can make international calls/data More likely to be stolen Loss of signal Screen size small so difficult to read</p> <p><b>Benefits</b> Phone home without having to find a landline/phone box Text messages can be sent home rather than finding a landline/ phone box Take photographs without having to use a separate camera Take videos without having to use a separate video camera Look up tourist information easily Translate the languages immediately Contact accommodation without having to go to tourist information Make bookings immediately/without visiting the theatre/hotel/event Can be used for sat nav without having to carry maps</p>	8