Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

7588419762

INFORMATION AND COMMUNICATION TECHNOLOGY **0417/13**

Paper 1 Theory **October/November 2020**

2 hours

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use an HB pencil for any diagrams, graphs or rough working.

INFORMATION

- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [ ].
- No marks will be awarded for using brand names of software packages or hardware.

This document has **16** pages. Blank pages are indicated.

DC (DH/FC) 189827/3

[Turn over

1 A desktop computer consists of both hardware and software. The software is either applications software or system software.

(a) Tick **(✓)** whether the following are examples of **applications** software or **system** software.

	applications (✓)	**system (✓)**
Measurement software		
Linker		
Database		
Utility software		

[2]

(b) Identify **two** internal items of hardware that could be found in a desktop computer.

1 .....

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2 .....

.....

[2]

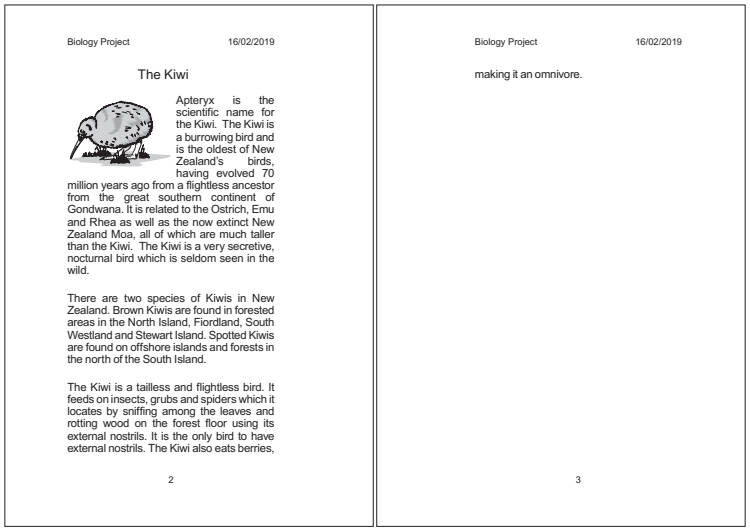
2 A computer system uses two types of documentation: technical and user. Some items only appear in the technical documentation and other items only in the user documentation, whereas some items appear in both.

Tick **(✓)** whether the following items appear only in **Technical documentation**, only in **User documentation** or in **Both**.

Item	**Technical documentation (✓)**	**User documentation (✓)**	**Both (✓)**
Algorithms			
File structures			
Error messages			
Limitations of the system			
Hardware requirements			
Glossary of terms			

[6]

3 A student has produced a document for her biology project. Part of the project is shown. Answer the questions relating to the document.



Biology Project 16/02/2019

The Kiwi

Apteryx is the scientific name for the Kiwi. The Kiwi is a burrowing bird and is the oldest of New Zealand's birds, having evolved 70 million years ago from a flightless ancestor from the great southern continent of Gondwana. It is related to the Ostrich, Emu and Rhea as well as the now extinct New Zealand Moa, all of which are much taller than the Kiwi. The Kiwi is a very secretive, nocturnal bird which is seldom seen in the wild.

There are two species of Kiwis in New Zealand. Brown Kiwis are found in forested areas in the North Island, Fiordland, South Westland and Stewart Island. Spotted Kiwis are found on offshore islands and forests in the north of the South Island.

The Kiwi is a tailless and flightless bird. It feeds on insects, grubs and spiders which it locates by sniffing among the leaves and rotting wood on the forest floor using its external nostrils. It is the only bird to have external nostrils. The Kiwi also eats berries,

2

Biology Project 16/02/2019

making it an omnivore.

3

(a) Give the name of the extra margin between the two pages of the document.

..... [1]

(b) Give the name of the space above the document, containing 'Biology Project' and the date.

..... [1]

(c) Name the term given to the single line of text that has overflowed on to the next page.

..... [1]

(d) Name the type of alignment used for the body text.

..... [1]

(e) The student has placed an image in the document.

Name the type of formatting used to allow the text to flow around the image.

..... [1]

4 Generic file formats allow data to be opened in any platform.

Identify **two** generic text formats.

1 .....

2 .....
[2]

5 When a website is created, three web development layers are used: the content layer, the presentation layer and the behaviour layer.

(a) Describe what is meant by the content layer.

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..... [3]

(b) Describe what is meant by the presentation layer.

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..... [3]

6 The manager of a company is planning to create a computerised system and has asked a systems analyst to research the current system. The systems analyst could do this by using a number of different methods, but has chosen to create and send out a questionnaire to members of the company.

(a) Discuss the benefits and drawbacks of sending out questionnaires to members of the company.

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..... [6]

(b) The system has been created. As the data is entered into the system it is verified.

Give **two** methods of verification.

1 .....

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2 .....

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[2]

(c) Explain why data still needs to be validated even though it has been verified.

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..... [4]

7 A house contains a microprocessor-controlled central heating system.

(a) Identify **two** input devices that would be used in this system.

1 .....

2 .....
[2]

(b) Describe how a microprocessor would use the data from these devices to control the central heating system.

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..... [6]

8 A spreadsheet has been produced showing the final places in one of the events in the 2018 Winter Olympic Games.

	A	B	C	D	E	F	G	H	I	J
1										
2	**Country**	**Name**	**Heat1**	**Heat2**	**Heat3**	**Heat4**	**Total Time**	**Min**	**Seconds**	
3	KOR	Yun Sungbin	50.28	50.07	50.18	50.02	200.6	3	20.55	20.6
4	LAT	Martins Dukurs	50.85	50.38	50.32	50.76	202.3	3	22.31	22.3
5	GBR	Dom Parsons	50.85	51.41	49.33	50.62	202.2	3	22.21	22.2
6	OAR	Nikita Tregubov	50.59	50.50	50.50	50.59	202.2	3	22.18	22.2
7	LAT	Tomass Dukurs	50.88	50.58	50.65	50.63	202.7	3	22.74	22.7
8	KOR	Kim Jisoo	50.80	50.86	50.51	50.81	203.0	3	22.98	23.0
9	GER	Axel Jungk	50.77	51.01	50.83	50.99	203.6	3	23.60	23.6
10										

The event consists of four heats. The times taken to complete each heat are added together to give the Total Time, in seconds. This is then displayed as minutes and seconds.

Two formulae form this calculation; they are stored in column H and column J.

The formula in cell H3 is: =INT(G3/60)

(a) Explain what the formula in cell H3 does.

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..... [2]

The formula in cell J3 is: =ROUND(I3,1)

(b) Explain what the formula in cell J3 does.

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..... [2]

At the end of the competition, the table must be sorted into ascending order of Total Time. The top athlete would be in the gold medal position, the second in silver medal position and the third in bronze medal position. The Medal and Rank columns must be added.

This display should look like this:

	A	B	C	D	E	F	G	H	I
1									
2	**Medal**	**Rank**	**Country**	**Name**	**Heat1**	**Heat2**	**Heat3**	**Heat4**	**Total Time**
3	Gold	1	KOR	Yun Sungbin	50.28	50.07	50.18	50.02	200.55
4	Silver	2	OAR	Nikita Tregubov	50.59	50.50	50.50	50.59	202.18
5	Bronze	3	GBR	Dom Parsons	50.85	51.41	49.33	50.62	202.21
6		4	LAT	Martins Dukurs	50.85	50.38	50.32	50.76	202.31
7		5	LAT	Tomass Dukurs	50.88	50.58	50.65	50.63	202.74
8		6	KOR	Kim Jisoo	50.80	50.86	50.51	50.81	202.98
9		7	GER	Axel Jungk	50.77	51.01	50.83	50.99	203.60
10									

(c) Explain the steps that must be taken to amend the spreadsheet and to display the data in this way.

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..... [6]

The heat times are measured by a computer system, but could be measured by officials with stopwatches.

(d) Discuss the advantages and disadvantages of using computers in measurement rather than humans.

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..... [6]

9 Legal documents can be sent by email, as a file attachment, or by physical fax.

(a) Describe the advantages of using emails compared with physical faxing.

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..... [5]

A legal document is sent as a file attachment.

(b) Explain the steps that need to be taken to ensure that if a virus is attached to the file, it cannot infect the computer.

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..... [4]

A computer virus has been downloaded from an infected file.

(c) Describe **three** effects this could have on a computer.

1 .....

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2 .....

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3 .....

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[3]

10 The use of ICT in organisations has changed the way in which employees work.

(a) Describe, giving an example, what is meant by compressed hours.

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..... [3]

(b) Describe, giving an example, what is meant by flexible working.

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..... [3]

11 The director of a museum in China is planning an exhibition on ancient civilisations. One of the exhibits is a full representation of a 10 000-year-old human. The Natural History Museum in London is planning to send a complete skeleton, but it is too fragile.

(a) Describe how a computer could be used to create a 3D copy of the skeleton which will then be printed in China.

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..... [5]

(b) Describe **four** benefits of using 3D printers.

1 .....

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2 .....

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3 .....

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4 .....

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[4]

12 Autonomous vehicles such as taxis are being tested on the world's roads. This type of taxi is able to drive between two points without the driver having control of the vehicle. The vehicles use satellite navigation and wireless technology with sensors to navigate and control the vehicle.

Evaluate the use of these technologies when navigating and controlling vehicles in this way.

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13 Email is a common way of communicating with other people. Netiquette is associated with emailing.

A headmistress of a school has asked the network manager to produce a document listing netiquette rules the staff and students should follow when sending emails from the school.

Describe, giving reasons, **three** rules that he could produce.

1 .....

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2 .....

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3 .....

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[6]

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Cambridge Assessment International Education

Cambridge IGCSE™

INFORMATION AND COMMUNICATION TECHNOLOGY **0417/13**

Paper 1 Written **October/November 2020**

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 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U 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.

<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th></tr>
<tr><td>1(a)</td><td>
<table>
<tr><th></th><th>applications (✓)</th><th>system (✓)</th></tr>
<tr><td>Measurement software</td><td>✓</td><td></td></tr>
<tr><td>Linker</td><td></td><td>✓</td></tr>
<tr><td>Database</td><td>✓</td><td></td></tr>
<tr><td>Utility software</td><td></td><td>✓</td></tr>
</table>
4 correct ticks = 2 marks
2 or 3 correct ticks = 1 mark
1 correct tick = 0 marks
</td><td>2</td></tr>
<tr><td>1(b)</td><td>**Two** from:
Processor
Motherboard
Random access memory (RAM)
Read only memory (ROM)
Video card
Sound card
Graphics card</td><td>2</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2</td><td>
<table>
<tr><th>Item</th><th>Technical documentation (✓)</th><th>User documentation (✓)</th><th>Both (✓)</th></tr>
<tr><td>Algorithms</td><td>✓</td><td></td><td></td></tr>
<tr><td>File structures</td><td>✓</td><td></td><td></td></tr>
<tr><td>Error messages</td><td></td><td>✓</td><td></td></tr>
<tr><td>Limitations of the system</td><td></td><td></td><td>✓</td></tr>
<tr><td>Hardware requirements</td><td></td><td></td><td>✓</td></tr>
<tr><td>Glossary of terms</td><td></td><td>✓</td><td></td></tr>
</table>
</td><td>6</td></tr>
</table>

Question	Answer	Mark
3(a)	Gutter margin	**1**
3(b)	Header	**1**
3(c)	Widow	**1**
3(d)	Fully justified	**1**
3(e)	Text/word wrap	**1**

Question	Answer	Marks
4	**Two** from: csv – comma-separated values txt – text rtf – rich text format	**2**

Question	Answer	Marks
5(a)	**Three** from: Created using HTML Every aspect of the site's content/information/data should be represented in this layer Can consist of text/images/hyperlinks/multimedia Layer used to create the structure of the web page	**3**
5(b)	**Three** from: Usually includes media queries Media queries changes the site's display based on screen size and device This is used to display and format elements within the web page/format of the web page/customise This layer is defined by CSS (Cascading Style Sheets) Contain styles that indicate how the document should be displayed in a web browser	**3**

Question	Answer	Mark
6(a)	**Six** from: **Benefits** Faster to complete all questionnaires than using interviews Cheaper to produce questionnaires than pay/employ an interviewer Individuals can remain anonymous therefore they are more truthful More people can answer the questionnaire than can be interviewed They can fill it in in their own time therefore quicker to complete overall **Drawbacks** Tend not to be popular with users Too inflexible cannot ask follow up questions Users tend to exaggerate their responses as they are anonymous As it's anonymous people may not take it seriously Cannot expand on their answers/limited in their responses To gain full marks at least one benefit/drawback must be given	**6**
6(b)	Visual verification Double data entry	**2**
6(c)	**Four** from: Data may be out of range but verification does not pick it up Data may be in the wrong format but verification does not pick it up Data may be missing from a field but verification does not pick it up Data may be of the wrong length but verification does not pick it up Validation checks that the data is sensible which verification does not Verification only checks that the data has been transferred correctly Verification only checks that the data matches the original source document Together they reduce the number of errors in the data	**4**

Question	Answer	Marks
7(a)	**Two** from: Keypad Temperature sensor Override switch for timing Touch screen Remote control//smartphone//tablet	**2**
7(b)	**Six** from: Microprocessor reads/receives the data The required temperature/preset value is keyed in using the devices The microprocessor compares the data with the preset value If the temperature is greater than or equal to the preset value then … … a signal is sent to the actuator … … actuator turns off the heaters If the temperature is lower than the preset value … … then a signal is sent to the actuator to turn on the heaters Process is continuous	**6**

Question	Answer	Mark
8(a)	=INT(G3/60) **Two** from: Gives the integer part of the calculation Works out the minutes The calculation is G3 divided by 60//Total time divided by 60	**2**
8(b)	=ROUND(I3,1) **Two** from: Rounds the value of I3//total time to 1 decimal place If the 2nd decimal place figure is 5 or more it rounds up If the 2nd decimal place figure is below 5 it rounds down//stays the same	**2**
8(c)	**For the sort** Max **four** from: Highlight A3 to G9 Select Sort Sort on Column I/Total Time Smallest to largest//ascending order **For the display** Max **four** from: Highlight columns A and B Click Insert column to the left Enter the titles Enter the Rank/Medal data	**6**
8(d)	**Six** from: **Advantages** More accurate Less expensive to run Data is more consistent More than one variable can be measured at a time/split times Results can be produced faster **Disadvantages** More expensive to purchase equipment/software Maintenance can be more expensive If the system fails/power outages could cause the computer to lose data/sensor fails To gain full marks at least one advantage and disadvantage is needed	**6**

Question	Answer	Mark
9(a)	**Five** from: The document/attachment loads directly into the computer's memory therefore better security The computer need not be switched on The computer receives a soft copy The fax does one thing at once therefore could be engaged The document in an email is in digital format Easier to send to multiple recipients People are more likely to have email rather than fax Print quality is better with email More accessible as it is can be sent/received by many devices The process of faxing is slower as the document needs to be scanned before sending With fax the paper could get damaged during scanning/printing Videos and audio can be sent by email	**5**
9(b)	**Four** from: The system must have installed anti-virus software The anti-virus software must be up to date/updated regularly//download anti-virus The email/attachment is scanned by the anti-virus software The email is not opened/attachment downloaded until any virus is removed by the anti-virus software	**4**
9(c)	**Three** from: Hard disk could be filled up The computer is performing routine tasks a lot more slowly Pop-ups keep appearing on the screen at random. Random reboots Software errors/software/computer doesn't work properly Recycle bin/files not working Computer hanging Anti-virus stops working System lock-up Files are being deleted	**3**

Question	Answer	Marks
10(a)	The worker completes the normal working hours per week But works fewer days For example: a 40 hour week compressed into 4 days not 5	**3**
10(b)	Workers complete the same amount of hours over a working week Workers can choose when to start and end <u>in agreement with the manager</u> For example: Workers start at 9:30 rather than 9am to miss school run/miss rush hour Explanation of flexible schedule	**3**

Question	Answer	Mark
11(a)	**Two** from: The skeleton is scanned A digital copy is made of the skeleton Copy is saved The data is sent via the internet to China **Three** from: Data is loaded into the software to prepare it for printing Software slices the model into hundreds of layers 3D printer creates the model layer by layer Binds them together	**5**
11(b)	**Four** from: Products can be customised easily on request Speed of producing the product is faster than making it by hand Cheaper than making it by hand due to labour costs Parts of equipment that are no longer made can be printed without having to manufacture them Many copies of the original can be made Saves the original from damage in transit Create a fragile object from more robust materials	**4**

Question	Answer	Marks
12	**Eight** from: **Examples for advantages** The taxi can be controlled safely by the computer Navigation systems find the quickest/safest route Data is constantly being updated in the vehicle therefore reacts quicker to changes Traffic efficiency improved Fuel efficiency is improved as the vehicle finds the best way of getting from A to B Roads will be safer as the vehicle can react faster to situations Decreases the amount of accidents on the road **Examples for disadvantages** Security problem of others gaining access to the vehicle … … and can control its operation example: slam on the brakes More expensive to set up wireless technology than manual systems If the wireless technology malfunctions the taxi will not be able to drive The driver must remain alert in case of problems Problem of disconnection stopping the vehicle … … if the wireless signal stops then the vehicle will not operate Requires a large number of new receiving stations and this is more expensive Interference/weather can affect the signal and can stop the vehicle If the system fails this can cause accidents Higher cost of maintenance To gain full marks at least one of each section are required	**8**

Question	Answer	Mark
13	**Matched pairs** Do not be abusive//be polite Do not threaten people with violence/Do not use abusive words/Do not cyber bully other students or incite bullying As this will be upsetting for others Check spelling and grammar This sets a good impression The points made are public Be careful what is written as comments can be read by other people Respect people's privacy Do not discuss or publish information that might embarrass Do not use capital letters As this is conveyed as shouting Don't send pornography As it can be upsetting Maintain your privacy Do not send personal details Check the email address carefully/check the names on the send list So that emails are not sent to strangers	**6**