Cambridge IGCSE™

CANDIDATE NAME	

CENTRE NUMBER		CANDIDATE NUMBER	

INFORMATION AND COMMUNICATION TECHNOLOGY **0417/11**

Paper 1 Theory **May/June 2021**

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.

1 Tick (✓) whether the following are examples of personal data.

	Yes (✓)	No (✓)
Full name		
Capital of England		
Gender		
Number of flowers in a garden		

[2]

2 Circle **two** input devices that could be used in a smartphone.

HDD   magnetic stripe reader   microphone   mouse

remote control   speaker   touchpad   touch screen

[2]

3 Describe **four** characteristics of a tablet computer.

1 ....

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2 ....

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3 ....

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4 ....

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[4]

4 Many banks have reduced the number of staff in their branches and replaced them with automatic teller machines (ATMs). These ATMs, which can be located within the bank, can be used by customers to deposit and withdraw money from their bank accounts.

(a) ATMs can be used to deposit cheques.

Describe the computer processing involved in depositing a cheque at an ATM.

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.... [6]

(b) Customers can visit these banks or use internet banking.

Discuss the advantages and disadvantages to a customer of visiting the bank rather than using internet banking.

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.... [6]

5 Tawara school has a shop that sells items needed by pupils in school. Part of a spreadsheet with details of the items is shown.

	A	B	C	D	E	F	G	H	I
1			Tawara School Shop					Tax rate	20%
2	Item		Cost Price	Selling Price	Profit	Tax	Amount sold	Total profit per item	Total tax per item
3									
4	School tie		$7.00	$9.99	$2.99	Y	139	£415.61	$277.72
5	School scarf		$10.00	$15.00	$5.00	Y	50	$250.00	$150.00
6	School blazer		$20.00	$25.00	$5.00	Y	180	$900.00	$900.00
7	Pen set		$10.00	$12.50	$2.50	N	100	$250.00	

(a) Write down the number of rows that are shown in the spreadsheet that contain text.

.... [1]

(b) Write down the number of columns that are shown in the spreadsheet that contain text.

.... [1]

(c) Tax is paid on certain items sold in the shop. The tax rate that has to be paid is 20% of the selling price. If tax is to be paid on an item, then 'Y' is placed underneath the Tax heading.

The formula in I4 is: IF(F4="Y",(I1*D4*G4),"")

Explain, in detail, what the formula does.

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.... [5]

(d) Explain the steps that need to be taken to display cell H4 as US dollars.

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.... [2]

6 You have been asked by the secretary of a soccer club to create a website to publicise its results, fixtures and other events.

When the website has been created it has to be published on the internet. You plan to upload it onto the internet using FTP.

(a) Explain what is meant by FTP.

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.... [2]

(b) Explain how to upload and publish the content of a website using FTP.

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.... [4]

(c) Before the website is published it needs to be tested.

Write down **three** different features of the web pages that could be tested. For each feature, describe the method you would use to carry out the test.

Feature 1...

Method...

....

Feature 2...

Method...

....

Feature 3...

Method...

....

[6]

7 A systems analyst has created a new computer system to keep records in a medical centre. She has created a relational database to store the medical records of patients.

The database uses primary and foreign keys.

(a) Describe what is meant by a relational database.

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.... [3]

(b) Explain the difference between a primary key and a foreign key.

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.... [4]

(c) A dentist works at the medical centre. The dentist stores the medical records of his patients.

Describe **four** other uses of the database software that the dentist can use to help him in his work.

1...

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2...

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3...

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[4]

(d) The data stored on the computer system needs to be protected from unauthorised access.

Discuss the effectiveness of different methods of increasing security of this data.

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.... [8]

8 Compare and contrast the features of a switch and a hub.

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.... [6]

9 A company operates from 08:00 to 19:00, Monday to Friday. Full-time employees work a 40-hour week, starting at 09:00 and finishing work at 17:00.

For each of the times worked by an employee, write down the most appropriate working pattern.

(a) An employee works from 09:00 to 13:00, Monday to Friday.

.... [1]

(b) An employee works from 09:00 to 19:00, Monday to Thursday.

.... [1]

(c) The work of two employees combined is a 40-hour week; each work for two full days and a half day.

.... [1]

(d) An employee works a full 8-hour day but has negotiated with his employer to complete this at some point between 08:00 and 19:00, each day.

.... [1]

10 Tick (✓) the most appropriate method of implementation to match the statements below.

	Direct (✓)	Parallel (✓)	Pilot (✓)
All of the benefits are immediate.			
If the new system fails the whole of the old system is still operational.			
This is the cheapest implementation method.			
The system is implemented in one branch of the company.			

[4]

11 Data stored on a computer system is at risk of being hacked.

(a) Explain what is meant by the term hacking. Include in your answer **two** examples of the effects this can have on the computer system.

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.... [3]

(b) Describe **three** measures that could be taken to protect the data from being hacked.

1...

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2...

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3...

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[3]

12 An image has been changed in a number of different ways.

Original image

For each of the following images describe the software editing technique used in order to produce the edited images shown from the original image.

Edited images

| A | B | C | D |

A ....

....

B ....

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C ....

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D ....

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[4]

13 RockIT Airlines representatives use a computer booking system to book flights for customers.

A representative from the airline types in the customer reference number, the number of passengers, departure time, departure date, departure airport and the destination airport.

A customer is planning to take a flight from London Heathrow Airport. The representative types in a code LHR for London Heathrow Airport. One of the reasons for using a code for the airport is to improve data accuracy.

(a) Describe **two** other advantages of using a code rather than typing out the full name.

1...

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2...

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[2]

(b) Describe the importance of data accuracy when making a booking.

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.... [2]

(c) Describe the processing and outputs involved in making the booking.

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.... [6]

Question 14 starts on page 16.

14 A road through a village has a speed limit of 45 kilometres per hour. The police are checking and recording the speed of vehicles passing through the village using measuring hardware and software, so they can produce a report of their findings.

(a) Explain the difference between measurement and control when using microprocessors.

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.... [2]

(b) Describe the role of the microprocessor in this scenario.

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.... [4]

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INFORMATION AND COMMUNICATION TECHNOLOGY	0417/11
Paper 1 Written	May/June 2021
MARK SCHEME	
Maximum Mark: 100	

Published

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.

Question	Answer	Marks
1	<table><tr><td></td><td>**yes**</td><td>**no**</td></tr><tr><td>Full name</td><td>✓</td><td></td></tr><tr><td>Capital of England</td><td></td><td>✓</td></tr><tr><td>Gender</td><td>✓</td><td></td></tr><tr><td>Number of flowers in a garden</td><td></td><td>✓</td></tr></table> 2 marks for 4 correct ticks 1 mark for 2 or 3 correct ticks 0 marks for 0 or 1 tick	2

Question	Answer	Marks
2	Microphone Touch screen	2

Question	Answer	Marks
3	**Four** from: Screens tend to be anti-glare Uses touch screen Front and back facing cameras are included Has a built in battery Lightweight Uses Bluetooth/WiFi/3G/4G/5G Uses solid state memory Uses an onscreen keyboard Portable Small footprint	4

Question	Answer	Marks
4(a)	**Six** from: Customer is asked to enter their debit card in the ATM Customer's bank computer is contacted The card details are searched in the bank database Card is checked to see if valid/in date/stolen Customer is asked to enter their PIN PIN is compared to the PIN stored on the chip Customer is asked to deposit cheque The system checks whether the cheque is valid The cheque is scanned/read by the ATM Amount is scanned Bank account is checked for sufficient funds The image of the scan is saved The customer is asked to select the account to deposit money Money is deducted from the bank of the cheque Money is added to the account of the payee A receipt is sent to the printer at the ATM	**6**
4(b)	**Six** from: *Advantages* Retention of banks therefore all customers could use them Easier for customers to speak to a member of the banking staff Customers do not have to purchase expensive computer equipment Safer than carrying out transactions over the internet Can withdraw cash Do not need the internet *Disadvantages* Have to pay to travel to the bank to use the service Customers could waste time standing in queues/travelling to the bank More difficult for people who have a condition which affects their mobility Smaller customer base as it is local Potential for physical robberies Cannot keep track of the accounts as easily Not 24/7 **To gain full marks there needs to be advantages and disadvantages**	**6**

Question	Answer	Marks
5(a)	6 rows	**1**
5(b)	8 columns	**1**

Question	Answer	Marks
5(c)	**Five** from: If Tax is payable then//If F4 is equal to "Y" then If true the tax is paid Multiply the rate of tax/I1 … … by the selling price/D4 … by the amount sold/G4 If Tax is not payable//If F4 <>"Y"//Else//Otherwise … … then display a blank … the tax is not paid	**5**
5(d)	**Two** from: Highlight/select cell H4 Select format cells Select currency/accounting Select dollar/USD icon	**2**

Question	Answer	Marks
6(a)	**Two** from: File transfer protocol <u>Network</u> protocol Used for transferring files from one computer to another	**2**
6(b)	**Four** from: Download the FTP client program Connect to the FTP server ... ... using the FTP client program Login to the server ... ... using FTP username and password Locate the files on your computer Click upload button on FTP client program Upload the files to the folder/web hosting space	**4**
6(c)	Matched pairs – 1 mark for the feature and 1 mark for the method Hyperlinks Click each hyperlink to see that it takes the user to the correct web page/part of the web page/website Form buttons/icons Click to see that they carry out the correct task Text Use spellchecker/grammar checker/proofread text to check it makes sense Images Check the images are not pixelated/correct size/correct image Videos Check the videos run correctly/correct video Sound Check the sound file runs correctly/correct sound file linked	**6**

Question	Answer	Marks
7(a)	**Three** from: Contains more than one table Tables are linked It uses relationships Removes redundancy of data Saves storage space	**3**
7(b)	**Four** from: Primary key holds unique data Primary key identifies the record Primary key can be automatically indexed Each table has one primary key whereas a table can contain a number of foreign keys Foreign key is used to link with the primary key of another table	**4**
7(c)	**Four** from: Searches/queries can be used to search details of patients Reports can be created about treatment carried out Formulas can be created to calculate the cost of treatment Charts can be created showing missed appointments by patients Images are stored of the x-rays to identify the patient/determine treatment Mail merge appointments that have been missed Any other appropriate use plus explanation	**4**
7(d)	**Eight** from: *Factors increasing effectiveness* Strong passwords are difficult to crack Biometric passwords are harder to crack Regularly changing passwords increases security Use of two-factor authentication Using different passwords for parts of the computer system makes it more difficult to gain access to the full system Firewall required to stop attacks from computers Firewall stops fraudulent sites attacking the computer Anti-spyware stops passwords being seen when typed in *Factors reducing effectiveness* Too complex a password can be easily forgotten Passworded files may not be backed up Using a number of different passwords can become cumbersome Regularly changing passwords means that passwords may be forgotten May be difficult to choose unique password if it is changed every few weeks Passwords may become more easy to guess if regularly changed Hackers can breach most passwords The firewall can affect the operation of the computer and stop some uploads The firewall may need to be shut down at times to upload files therefore making computer unsafe Some legitimate software can be blocked by the firewall **To gain full marks both sides of the discussion are needed**	**8**

Question	Answer	Marks
8	**Six** from: *Comparison* Both are network devices Both are hardware devices Both have computers and devices connected to them Both send data to devices//Both are communication devices *Contrast* In a hub data packets/data are broadcast to every device connected to it A hub is less secure than a switch in distributing data Switch checks the data packet Switch sends to an appropriate device **To gain full marks both contrast and comparison is needed**	**6**

Question	Answer	Marks
9(a)	Part time	**1**
9(b)	Compressed hours	**1**
9(c)	Job sharing	**1**
9(d)	Flexible hours	**1**

Question	Answer				Marks
10		**Direct**	**Parallel**	**Pilot**	**4**
	All of the benefits are immediate.	✓			
	If the new system fails the whole of the old system is still operational.		✓		
	This is the cheapest implementation method.	✓			
	The system is implemented in one branch of the company.			✓	

Question	Answer	Marks
11(a)	Gaining <u>unauthorised</u> access to a computer system – 1 mark **Two** from: *Examples* Can lead to the identity theft of data Can lead to the misuse of/access to personal data Data can be deleted Data can be changed Data can be corrupted Place malicious files/software	3
11(b)	**Three** from: Use of firewalls to block unauthorised computer systems Use of passwords Use of intrusion detection software/anti-spyware Use two-factor authentication Switch off WiFi/computer when not in use	3

Question	Answer	Marks
12	A - Resize the image maintaining aspect ratio B - Rotate the image 90 degrees anti clockwise/counter clockwise//270 degrees clockwise C - Reflect the image in the Y axis D - Brightness adjusted	4

Question	Answer	Marks
13(a)	**Two** from: Uses up less memory in the computer Quicker to enter the data Quicker to search for data	2
13(b)	**Two** from: If the data is typed in incorrectly then the booking may be rejected If an incorrect airport code is used they may fly to the wrong airport//May miss the flight If the customer reference number is typed in incorrectly then the booking may be assigned to the wrong person If the number of passengers is incorrectly entered then number of seats will be wrong/overbooked So that the wrong booking is not made	2

Question	Answer	Marks
13(c)	**Six** from: Display flights available Booking database is searched for the customer reference number Matching record is retrieved Details of the customer are displayed on the screen Booking database is searched for matching departure airport Booking database is searched for matching destination airport If flight correct, date/time found Search if seats/tickets/flight available If unavailable error message output Outputs the price If seats available, flags seat as booked If not booked then flag removed Reduces number of seats/tickets available by number booked E-ticket/ticket details are output E-ticket/ticket details sent to customer Receipt is printed//Verification email sent	**6**

Question	Answer	Marks
14(a)	Measurement is the monitoring/recording of physical variables without the microprocessor taking action Control is when the microprocessor takes action depending on sensor readings	**2**
14(b)	**Four** from: Microprocessor reads the data Data/Speed limit is stored in the computer Divides the distance travelled by time taken between the readings The speed of the vehicle is then compared to the speed limit of the road The speed is recorded It sends the data for later processing Graphs are <u>automatically</u> produced of the number of cars speeding	**4**