Cambridge Assessment International Education

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.

2

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. They are light weight hence more portable

2. They have an inbuilt battery hence can be used on the move.

3. They use touch screen hence easier to use.

4. They have inbuilt bluetooth lwi-fi Capability and hence data transfer is easier.

[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.

- First the client is asked to enter their debit Card number via ATM keypad, the Card details are searched in the bank database.
- The Card's validity is verified by customer entering the PIN, and this is compared to the PIN stored on the Chip.
- The customer is asked to deposit the cheque where the system scans the cheque, the details are captured that includes the amount and image is saved of the entire cheque.
- The system checks if the bank account has sufficient funds, if yes then the customer [6] is asked to select the account to deposit money. The funds are deducted from the bank (drawer) and added to the payee account.
Thereafter a receipt is printed via the ATM thermal printer as evidence of the transaction

(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.

Advantages of physical Banking.
- It is favourable to people who don't know how to use computers and Internet.
- There's good Customer rapport rather than visiting the online platform where its not able to answer queries.
- There's minimal Cover of Fraud.
Disadvantages of physical Banking.
- It has limited access timings (Only available as long as the bank is open)
- Its time Consuming as one has to travel to the bank and queue as well to be served.
- There are Cases of physical robberies hence risky. [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. Columns.

	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	

Rows

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

6 Rows [1]

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

8 Columns. [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.

IF is a function that is used to check a condition.
IF checks if Tax column is payable i.e "Y".
IF condition is True; it multiplies the tax rate given in Cell I1 by the selling price and also the amount Sold.
i.e If yes, multiply I1 * D4 * G4
If false; ie tax not payable then it displays a blank field.

[5]

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

— Highlight Cell H4, then go to Format Cells. Select Number, then Currency, select dollar symbol and then click OK.

[2]

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[Turn over

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.

Protocol- rules and guidelines that govern transmission of data

FTP - File transfer Protocol.
This is a network protocol that is used
in transferring of files from one computer
to another.

[2]

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

- First download the FTP Client program or login
to the Cpanel admin using the credentials given
by the Internet Service provider hosting your website.
- After login to the FTP program, login to the
server as well.
- Locate the files on your computer, then click
upload button on FTP Client program.
- Thereafter upload the files to the folder [4]
where space has been provided by the
web - hosting company.
- Refresh the site and then log out from
the Cpanel / FTP client program.

7

(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 Hyperlinks

Method This is a test of all the links if they are working properly. This test all navigation links.

Feature 2 Form buttons

Method This include Submit, Reset, or exit button or even a call to function.

Feature 3 Videos and Images

Method Check if the videos are playing properly and images are loading correctly.

[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.

A relation - Table.
A relational database is where many tables
are linked together by use of an appropriate
primary and secondary keys.
It helps to reduce duplication of data.

[3]

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

A primary key is a unique field that is used
to identify a specific element/item in the database.
The primary key can be automatically be indexed.
A foreign key is a field in another table
where it is a primary key in a separate table.
A foreign key is used to link with the primary
key or another table.
Each table has one primary key whereas a table [4]
can contain a number of foreign keys.

(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. The dentist is able to receive/generate reports at any given time from the database.

2. He can incorporate formula hence automate the calculation of total cost of treatment.

3. By use of specific customised queries, he can be able to search for details of patients

4. Using the image object, images are stored of the X-rays to identify the patient, or even determine treatment.

[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.

mention the different security methods and explain their effectiveness:

1. Use of strong and complex passwords: They are difficult to guess or crack; but sometimes users tend to forget. Use familiar patterns to avoid forgetting

11. The use of Biometrics: They are difficult to crack as they physically need the person there.

111. Use of firewall:- They filter all incoming and outgoing traffic. They block all malicious attacks.

1V. The use of anti-spyware / key logging software. They protect passwords being seen when the user is typing in.

V. Use of two-factor authentication like use of password and then an OTP number is sent to the users phone. This will help to enforce security of the system. [8]

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

— Comparisons
— They are both networking devices that are used
to centrally inter-link all the other computers.
— They both send data to connected devices.
— They are all hardware devices.
Contrast | Differences
— While using a hub, it broadcast data to
all the devices connected to it while with
a switch, it reads the data packet to get specific address.
— The switch sends directly to the specific device
hence it tends to be more faster.

[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.

Part-time

[1]

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

Compressed hours

[1]

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

Job Sharing

[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.

Flexible hours.

[1]

 [Turn over

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.

This is a Computer threat where an unauthorised user gains unauthorized access into the computer system. Effects of hacking:
i) The hacker ends up deleting or altering the stored data.
ii) He/she can access personal data.
iii) One can end up installing malicious programs.   [3]

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

1. By use of strong and complex passwords. They should be frequently changed.
2. Use of firewall that filters all incoming data. Any unauthorized user is blocked.
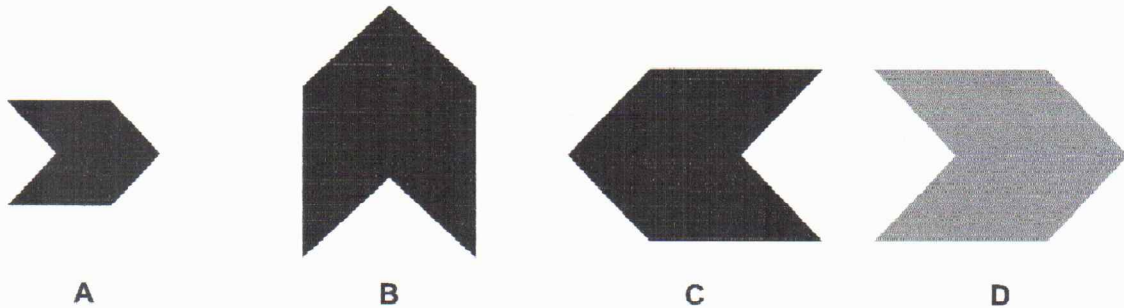3. Incorporate the use of intrusion detection system.

[3]

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

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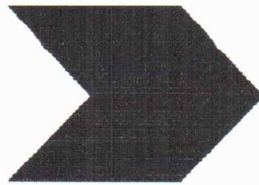
For each of the following images describe the software editing technique used in order to produce the edited images shown from the original image.

Edited images

A   B   C   D

A ....The image has been resized while its aspect ratio has been maintained.

B ....90° rotation in an anti-clockwise direction.

C ....Reflection :- Reflected image on the Y-axis.

D ....The brightness has been reduced hence looks lighter.

[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. It ends up Consuming less memory space.

2. It fastens the process of searching the data. – Less number of characters are looked for.

[2]

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

This is because, if wrong code is typed, then the user may miss their flight or re-directed to a wrong airline. Also if customer reference number is typed in incorrectly, then the booking may [2] be assigned to the wrong person.

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

Processing and outputs.
— The system via output device displays the available flights, then the customer number is input where the booking database searches for it.
— Customers details are displayed, then both the departure and destination airports are searched for.
— If flight ok, then the dates and time are checked.
— In addition, the seats available are checked and if unavailable, an error message is output if incorrect/unavailable flight.
— If seats available, it flags seats as booked, then reduces the available seats from the booking database. [6]
— The e-ticket is displayed and also sent to the customer's email.

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.

Measurement is where the recording of physical variables like speed take place without microprocessor taking action whereas Control is when the microprocessor takes action depending on sensor readings. [2]

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

The microprocessor are used to read the data via use of specific sensors.
It is also used to compare the speed limit stored in the computer with the speed of the vehicle where the output is sent out for further processing.
Graphs are automatically produced of the number of cars speeding. [4]