Cambridge Assessment
International Education

Cambridge IGCSE™

CANDIDATE NAME	

CENTRE NUMBER		CANDIDATE NUMBER	

INFORMATION AND COMMUNICATION TECHNOLOGY 0417/12

Paper 1 Theory October/November 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. Any blank pages are indicated.

[Turn over

1 A computer consists of both hardware and software.

(a) Give **two** examples of input devices which are part of a laptop computer.

1 ...... WebCam   — Touchpad ......

2 ...... Keyboard   — Microphone ......

[2]

(b) There are two types of software: system and applications.

Give **two** examples of system software.

1 ...... Operating System ......

2 ...... Utility program ......

[2]

2 Tick (✓) the most appropriate printer which relates to the following statements.

	3D (✓)	Dot matrix (✓)	Laser (✓)
This printer is an impact printer		✓	
This printer uses toner			✓
This printer uses an inked ribbon		✓	
This printer uses tomography	✓		

[4]

3 (a) Describe **two** disadvantages of using a tablet computer rather than a laptop computer.

1 ...... They have a smaller screen and therefore can be more difficult to read and also watch videos.

2 ...... With laptop computers, one can install more programs than with tablets. Tablets are more limited.

[2]

(b) Modern computers often do not have an optical drive.

State **two** ways music can be transferred onto a computer that does not contain an optical drive.

1 *Transferred via flash drive / HDD / SDD that is plugged in via USB port.*

2 *Transferred via email attachment, then the user downloads*

– Sent via bluetooth from another device.

[2]

4 Write down the most appropriate network device to match the following statements. Your answers should be different in each part.

(a) This network device checks the data packet arriving from one computer and sends the data to a specific computer.

Switch [1]

(b) This network device sends the data packet from a computer to all devices connected to it.

Hub [1]

(c) This network device connects a LAN to the internet.

Router [1]

(d) This network device connects one LAN to another with the same protocol.

Bridge [1]

4

5 The Internet of Things (IoT) is a computer network which allows users to control household devices remotely. It has many benefits, for example a user can turn on the house central heating via a smartphone. The IoT can use WiFi and Bluetooth which can cause problems regarding data security.

Describe the methods that could be taken to protect the user's data.

- Change of default username and password for the router.
- Always use a strong and complex password that is not easy to guess.
- The wi-fi password needs to be changed more frequently and avoid re-using the password.
- Install a firewall that will be used to filter all incoming and outgoing traffic.
- Avoid logging into various devices using a public wifi network. This reduces the risk of exposing your devices.
- Do not use the same password for all the devices. Each device should have its login details.
- Ensure all the privacy settings have been checked and properly configured.

[6]

6   As a student you often use a computer keyboard. This could be a virtual keyboard or a physical keyboard on a desktop computer, a laptop computer or even a smartphone.

Evaluate your use of computer keyboards in terms of <u>health risks</u>, and explain <u>any</u> strategies you use to minimise these health risks.

Health risks associated to the use of keyboards.
- Neck and back pain caused by sitting for long hours
- Repetitive strain lying as a result of much typing.
Strategies to counter the health risks:
> by frequently taking breaks instead of being sitted
for long. After every one hour, one is encouraged to take break.
- Use of ergonomic chair where one can easily be
able to adjust their sitting position.
- Use of ergonomic keyboards. This will enable one to
properly adjust the keyboard so that typing is made easy.
- Use of an arm rest to place one's hand while typing
- The user needs to invest on other voice recognition.
System (use of microphone) so as to minimise alot of typing
- Ensure that the keyboard keys are soft and hence
user not applying alot of energy on the keyboard.
- The user needs to frequently do hand exercises.   [8]

6

7 Rockit Motors recently created a new car sales website. The website uses internet shopping features. Customers can ask questions of the virtual salespeople on the website, and then purchase the car on the website.

(a) Describe **two** other features of internet shopping.

- It allows user to login using username and password.
- A Shopping Cart that allows users to place in purchased items.
- Check out feature for Submission of the order. [2]

(b) Discuss the benefits and drawbacks of using internet shopping for Rockit Motors.

Benefits / Advantages
- The company will not need to open many branches because they are online hence reduces operational Cost.
- They operate 24/7 hence can do their Sales anytime.
- Buyers time is saved as users dont need to travel to the showroom.
- The company can sell cars all over the world.
Drawbacks / Disadvantages.
- Developing and maintaining the website is expensive.
- The system does not offer 'Test drive' options hence client Cannot have a feel of the car.
- Both the Client and the company are fully reliant on Internet hence without it they cannot be able to do business. [6]

0417/12/O/N/21

(c) Before the website became operational it needed to be tested. The web designer created a test plan including module and whole system testing.

Explain the difference between module and whole system testing.

A module is a software program that performs a specific task independently. Later they are integrated together to form the entire whole system.

- With module testing, the individual modules are tested independently and separately whereas with whole system test, it involves many modules all integrated together.

- Its easier to do module testing and to find bugs/errors as it involves a single program nature while with [4] whole system testing, its an entire process and takes time to locate all the errors.

8   You are creating a presentation on the World Games. You have created a spreadsheet showing the number of gold, silver and bronze medals awarded to different countries.

You are planning to create a graph in the presentation showing the country, the number of gold medals and the total number of medals.

	A	B	C	D	E	F
1		World Games Medals				
2						
3		Country	Gold	Silver	Bronze	Total
4	1	Italy	153	145	142	440
5	2	United States	142	131	109	382
6	3	Germany	137	111	138	386
7	4	Russia	137	110	72	319
8	5	France	101	102	105	308
9	6	China	68	55	27	150
10	7	Great Britain	61	89	210	360
11	8	Japan	55	38	53	146
12	9	Ukraine	47	36	125	208
13	10	Spain	42	42	42	126

CTRL to select

Original data

(a) Explain how you would create a vertical bar chart, showing the name of the country, the number of gold medals and the total number of medals awarded to each country, on a new slide in the presentation.

- Open the file in Microsoft Excel.
- Select the indicated cells above. How?
  Select B3 to C13. Don't click anywhere else.
  Hold the CTRL key on your keyboard;
  (This is to enable you select more cells while the others are still selected.) Then select cells F3 to F13.
  Click on Insert, then Bar chart, then select the appropriate chart type, and the chart will now display.
  Highlight the chart now so that its copied to powerpoint.
  Highlight and right click to copy, then open presentation software (powerpoint), add a new slide, select the right format of your slide, then paste the bar chart on the new slide. Add title and legend and any other information and then save the file.

[6]

With these type of questions, try working with test data on Excel. 9

(b) The total number of medals has been calculated manually and entered as a value. This could lead to errors.

Explain how you could create a formula to calculate the total number of medals awarded for Italy, using only the mouse. *note that you are not allowed to type in Formula.*

For Italy its Cell F4; Click on Cell F4 and then Click on Formulas, Click AutoSum or the 'Σ' icon. Confirm if it has picked the range correctly ie C4 to E4.
Besides the formula bar, there's a "✓" icon, Click on it; Its for the Enter button.

[4]

(c) Explain how the data could be sorted by the total number of medals won by each country. The country with the largest number of medals should be at the top of the list.

Highlight the entire cells that needs to be sorted ie B3 all through to F13.
Click on Data, then Sort.
Select 'data has headers'.
Select Sort by Column F Then
Select 'largest' to smallest or else in Descending form.
Click OK.
Save the work sheet.

[4]

9 Identify and describe the three web development layers.

1 Content layer:- Used to enter the content of a web page structure. It can consist of both text and/or images.

2 Presentation Layer:- Used to format whole web page(s) or individual elements. The layer is defined by the styles to indicate how elements are displayed.

3 Behaviour Layer:- Used to enter scripting language to a web page or an individual element. It allows interaction within the website.

[6]

10 A school is planning to change the way it reports back to parents about their child's academic progress. They plan to produce a mail merged document and then email this to parents.

They have created a spreadsheet which shows the pupil's name, target, attainment and effort levels for Maths and the Science subjects.

Part of the spreadsheet is shown.

	A	B	C	D	E	F	G	H	I	J	K
1	Name		Target level	Maths		Biology		Chemistry		Physics	
2				Attainment	Effort	Attainment	Effort	Attainment	Effort	Attainment	Effort
3	Ahmal	Wulandan	6	7	2	6	2	8	1	7	2
4	Nurul	Prakoso	8	7	3	7	3	9	1	7	2

(a) Design a suitable document layout to display the information of one pupil. The name of the pupil must be clearly shown separated from the rest of the data. It must have appropriate spacing. Do **not** include the pupil's data.

REPORT FORM TERM 1 2020/2021
for

FIRST NAME   LAST NAME

Target level   ☐

SUBJECTS   Attainment   Effort

Maths
Biology
Chemistry
Physics

[6]

(b) The attainment levels range from 1 to 9 and the effort levels range from 1 to 3. Before teachers are allowed to enter data, the spreadsheet needs to be tested.

Write down **one** example of extreme data to test the attainment field and **one** example of abnormal data to test the effort field.

Attainment – extreme data ...... Either 1 or 9 (Maximum values)

Effort – abnormal data ...... a , -1 ; Outside the defined range.

[2]

(c) Describe **four** advantages of using a mail merge for this document.

1 Mail merge is a faster process than editing each letter independently.

2 The reports look alike hence maintain consistency.

3 While sending the reports, one needs to do error checking once on the data and the template.

4 One can save the data source that comprise of addresses and this can be re-used again and again.

[4]

(d) When the mail merge is created, a special field containing the date needs to be added. This date will change automatically each time the merged document is sent or printed.

Explain how the date field can be added.

Place the cursor to the place where you want the date to be added; then click on Insert Field on the Insert menu bar. Then click on Quick parts and then select Date and Time. Select the Date format you need to use; at the bottom right, ☑ click on 'update automatically' [3] Checkbox then click OK.

11 An air-conditioning system has been fitted in a hotel bedroom. The air-conditioning system will contain fans which operate at varying speeds.

Identify the devices used in the system from the descriptions given.

(a) This device captures the temperature from the room.

.... Sensor .... [1]

(b) This device changes the data from the microprocessor into a form that can change the speed of the fan.

.... Digital to Analogue Convertor. .... [1]

(c) This output device operates the fan.

.... Actuator. .... [1]

12 Discuss the disadvantages of policing the internet. — Explain the points to earn full Marks.

- One might feel intimidated while making their comments Online hence one will not have freedom while posting.
- A number of Internet users tend to be anonymous and hence makes it very difficult to police internet users.
- Internet connectivity is global and that means that different countries have their by-laws hence some by laws might not be accepted in some country's hence a challenge.
- The cost and man-power needed to police the Internet is high hence a very expensive process.
- The use of Coded language among certain societal groups makes policing [6]

13 The internet has both moderated and unmoderated forums.

Explain what is meant by a moderated forum.

These are online discussion forums where before a post appears to the public/posted then the administrator has to approve.

In a moderated forum all posts are monitored and they don't meet the threshold they are removed. With moderated forums, they have rules to be adhered to and incase one does not adhere to them then they are banned from posting. [4]

14 Students in Tawara College are using the internet to find information for a project. They have been told that the college has a firewall.

(a) Explain what is meant by a firewall and why it is used.

A firewall is either a hardware or software that is used to filter all incoming and outgoing traffic in a network. They are very useful as:

- They check data coming in if it meets a set criteria and if not its blocked.

- It keeps a list of undesired IP address eg that leads one to pornographic sites; it blocks them.

- It keeps a log/record of all the accesses and also all data accessed within a given session. These records can be accessed later.

- It can alert a user about unwanted data being accessed within the network. [6]

The students visit different websites to get information for their project.

(b) Explain why it is **not** always easy for the students to find reliable information on the internet.

This is because, the internet has no owner and hence anyone can end up posting information online.

Sometimes one can access data online from different sources that are conflicting hence not able to verify.

If the website is not updated, then data might end up being obsolete and not relevant at all.

Some students don't know how to use key words to search hence always get wrong suggestions. [4]