



# Cambridge IGCSE™

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## INFORMATION AND COMMUNICATION TECHNOLOGY

0417/12

Paper 1 Theory

February/March 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 **20** pages. Any blank pages are indicated.



- 1 Tick (✓) whether the following are examples of internal or external hardware devices.

	internal (✓)	external (✓)
Mouse		
Video card		
Printer		
Actuator		

[2]

- 2 Geeta spends a great deal of time at work entering data into her computer.

State **three** items of hardware that Geeta should be provided with to help avoid RSI when she enters data into the computer.

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[3]

**Question 3 starts on page 4.**

- 3 Falyaz has created a diary using word processing software. The diary entry for 17<sup>th</sup> May 2020 is shown.

**17<sup>th</sup> May 2020**

First day of the holidays today and the family went to stay in a hotel near Cherai Beach in Kerala. This was a lovely place to spend the holidays with a long stretch of beach to play on. It is called the *Princess of the Arabian Sea*. We also visited a number of the lagoons in the area and met a lot of people. The weather was lovely, and the sun shone throughout most of the day.



- (a) Write down **four** formatting features of the word processing software used to make this diary entry.

Feature 1.....

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Feature 2.....

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Feature 3.....

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Feature 4.....

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[4]

(b) The original diary entry typed into the word processing software did not include an image.

Describe the steps that would be carried out by Falyaz to include in his diary entry an image taken from his digital camera.

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[6]

(c) Name **two** other sources of digital images apart from using a digital camera.

Source 1.....

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Source 2.....

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[2]

- (d) Tick (✓) whether the following statements about generic image files refer to jpg, png or gif file types.

	jpg (✓)	png (✓)	gif (✓)
This file type stores still or moving images			
This file type uses lossy compression			
This file type is used for storing photographs on a digital camera			
This file type is limited to 256 colours			

[4]

- (e) Falyaz wants to add a header in his word processed diary.

Explain what is meant by a header and why it is needed.

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[4]

- 4 The table shows a comparison of two different types of fitness tracker. A fitness tracker contains a microprocessor, is worn around the wrist and monitors physical readings of the wearer.

Name of fitness tracker	Flexi-byt 6	FitB 4
Battery life in days	20 days	7 days
Method of internet connection	Bluetooth	WiFi
Water resistant	100 m	10 m
GPS	Y	N
Cost	INR 22 855	INR 10 700

- (a) You have been asked to design a poster to show this data for the two fitness trackers.

Describe how you would use **six** different design features to enhance the data in this poster. The poster must be suitable for an audience of adult customers.

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- 2.....  
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- 3.....  
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- 4.....  
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- 5.....  
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- 6.....  
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[6]

(b) Describe the computer processing involved in the use of a microprocessor-controlled fitness tracker when displaying and monitoring the blood pressure of the user.

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[4]

5 A parent is concerned about his children sending texts. When sending a text, it is important to follow netiquette.

(a) Explain what is meant by the term netiquette.

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[2]



- (b) The parent is planning to produce a number of rules to ensure that his children follow netiquette when texting other people.

Write down **four** rules that he could include in his list.

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[4]

- 6 Complete the following sentences, using the most appropriate direct data entry device.

a bar code reader

a chip reader

MICR

a magnetic stripe reader

OCR

OMR

PIN pad

RFID reader

- (a) The device that reads data from a card in a contactless card system is called

..... [1]

- (b) The device that reads scanned text and converts it into a readable form is called

..... [1]

- (c) The device that reads the data made up of black lines and spaces on household goods is called

..... [1]

7 A school is planning to introduce a contactless card system for pupils to pay for school meals. Each card contains an amount of money which is topped up by parents. Parents transfer amounts of money into the school system and pupils place the card close to a reader to upload the money onto the card.

(a) Discuss the benefits and drawbacks, to the pupils, of using a contactless card system rather than paying by cash.

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[6]

(b) The terminals in the school use electronic funds transfer at point of sale (EFTPOS).

Describe the computer processing that takes place to pay for a meal at the EFTPOS terminal using the card.

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[6]

- 8 A computer system is being created to calculate the scores in a diving competition. Every dive by an athlete is awarded a score out of 10 by each judge.

The system is being tested using live data. An athlete completes his dive with a difficulty of 3.4 and achieves the following scores, which are displayed in a spreadsheet.

	A	B	C	D	E
1	Athlete:	Shivani Nehwal	Difficulty:	3.4	
2					
3		Score			
4	Judge 1	4.1			
5	Judge 2	6.3			
6	Judge 3	6.2			
7	Judge 4	5.3			
8	Judge 5	7.3			
9	Judge 6	6.1			
10	Judge 7	7.0			
11					
12	Overall Score				

- (a) Before the overall score is calculated the judges' scores need to be sorted into ascending order.

Describe the steps that would be carried out to sort the data into ascending order.

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[3]

(b) Cell B12 contains the formula,  $\text{ROUND}(\text{SUM}(\text{B5:B9}) * \text{D1}, 1)$ .

Explain what the formula in cell B12 does.

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[3]

(c) The judges' score column will be tested using normal, abnormal and extreme data.

Explain, giving examples of test data which would be used, what is meant by:

Abnormal test data.....  
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Extreme test data.....  
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[4]

- 9 Tawara school uses an optical mark recognition (OMR) system for its school register. An example of the register is shown. For each session of the school there are two lozenges to be shaded in.

**Tawara School**

Pupil Registration form

**INSTRUCTIONS:** Only use HB pencil when completing this form

Example:

Pupil present [■] [A]

Pupil absent [P] [■]

Pupil late [■] [■]

No.	Pupil Name	Mon		Tues		Weds		Thurs		Fri	
		am	pm	am	pm	am	pm	am	pm	am	pm
01		[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]
02		[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]
03		[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]
04		[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]
05		[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]
06		[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]	[P] [A]

At the start of the registration period the teacher shades in a lozenge [P] on the register to show that a pupil is present and shades in a lozenge [A] for each pupil who is absent. If a pupil is late then the teacher shades in both the [P] and the [A] lozenges. The register sheets are sent to the school office to be processed and the data from them is stored in the computer's database.

- (a) Describe the inputs and computer processing of the registers when they are sent to the school office, prior to them being stored on the computer's database.

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[6]

- (b) The headteacher of the school is considering modernising the registration system so that pupils can register using a facial recognition system.

Discuss the advantages and disadvantages of using a facial recognition registration system rather than the OMR system they currently use.

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[8]

(c) Biometric data, like facial recognition, is an example of personal data.

Give **two** other examples of personal data that could be stored on the school registration database.

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[2]



- 10** Computer data can be stored on physical storage devices. Data can also be stored in the 'cloud'.
- (a)** Explain what is meant by the cloud, giving **two** advantages of storing data in the cloud compared with physical storage devices.

Explanation.....

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Advantage 1.....

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Advantage 2.....

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[4]

- (b)** Tick (✓) whether the following storage devices are examples of optical, magnetic or solid state storage.

	optical (✓)	magnetic (✓)	solid state (✓)
Flash drive			
Hard disk drive			
Blu-ray disc drive			
SSD			

[4]

- 11 The owner of a bookshop has a database of all the books she has in stock. As some of the data is being entered into the database it is checked using validation checks.

An example of some of the records in the database is shown.

Field name	Example data
Name of book	Brotherhood of Wisdom
Name of author	Colin Turner
ISBN	471837951
Date of purchase	25/02/2021
Number of copies	10
Type of book	E
Name of book	The Fourth Man
Name of author	Aadha Khatri
ISBN	0718121753
Date of purchase	18/03/2019
Number of copies	53
Type of book	H
Name of Book	Indian Temples
Name of author	Vihaan Laghan
ISBN	978147183215
Date of purchase	12/02/2019
Number of copies	30
Type of book	H

Explain, using a field name and examples of the data stored in that field in the database, why validation checks must be appropriate to the data that is being checked.

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[4]

**12** A company has placed a firewall between their Local Area Network (LAN) and their internet connection. This is used to increase security in their computer systems.

Discuss the effectiveness of using this firewall to increase security.

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[6]

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