



Cambridge International AS & A Level

CANDIDATE
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INFORMATION TECHNOLOGY

9626/12

Paper 1 Theory

October/November 2022

1 hour 45 minutes

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.
- Calculators must **not** be used in this paper.

INFORMATION

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [].

This document has **12** pages. Any blank pages are indicated.

- 1 Here is a set of data.

^ >= <=

Explain why this is just a set of data and describe how this particular set of data would become information.

[4]

- 2 Describe what is meant by the term RAS (Reliability, Accessibility and Serviceability) when applied to mainframe computers.

[5]

3 Phishing, smishing and vishing are methods of fraudulently obtaining personal data.

(a) Describe **two** differences between phishing and vishing.

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[4]

(b) Describe how smishing is used to obtain personal data.

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[3]

- 4 Here is a spreadsheet created by the organisers of a concert. They have assumed that 400 people will attend the concert. They have also assumed that each member of the audience will purchase 2 snacks and 2 drinks during the concert. If these assumptions are correct, their profit will be \$710.

A	B	C	D
1	Estimated audience size		400
2			
3	Price	Quantity per concert goer	Income
4	Tickets	\$40	1
5	Drinks	\$2	2
6	Snacks	\$3	2
7	Souvenirs	\$20	1
8	Programmes	\$15	1
9		Total income	\$34,000
10			
11			Paid out
12	Electricity		\$650
13	Performers		\$22,000
14	Drink supplies		\$860
15	Snack supplies		\$880
16	Venue hire		\$5,000
17	Souvenir supplies		\$2,400
18	Programme supplies		\$1,500
19		Total outgoings	\$33,290
20			
21		Profit/Loss	\$710
22			
23			

A number of factors could affect the amount of profit.

- The audience size might be higher than the organisers estimated.
- Members of the audience might not buy 2 snacks and 2 drinks.
- The cost of souvenir supplies might change.

- (a) Explain how the organisers could use what-if analysis to see the effects of these three factors on their profit. You should refer to specific cells from the spreadsheet in your answer.
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[3]

- (b)** The organisers wish to achieve a larger profit.

By explaining what each step requires them to do, describe how the organisers would use goal seek to find the size of the audience needed to make a profit of \$5000. You should refer to specific cells from the spreadsheet in your answer.

Include in your answer a reason why the result might not be satisfactory.

[4]

- 5 The owner of a book shop has created a database of her books. She will now test that it works. Some of the records are shown. The data shown contains the maximum and minimum values. There are only two types of book.

ISBN	Title	Author	Book_type	Copies
9781787632196	Blue Moon	Lee Child	H	4
9781858683416	Prelude to Foundation	Isaac Asimov	P	5
9780593072493	Inferno	Dan Brown	H	3
9781787461352	Revenge	James Patterson	P	2
9781529027488	One Good Deed	David Baldacci	H	5

- (a) Describe, in detail, the **three** most appropriate validation checks, apart from a check digit, type check or presence check, that could be used to validate the data. For each validation check, your description should include the field it could be used for. Each validation check and each field must be different.

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[6]

- (b) The owner will also need to verify the data in her database.

Using examples from the three fields you used in part (a), explain why verification is needed in addition to validation.

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- 6 Explain why supercomputers are used for weather forecasting.

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- 7 (a) Explain how malware can be used to carry out industrial espionage.

[4]

- (b)** A rootkit is a type of malware.

Describe the features of a rootkit.

[4]

- ## 8 Encryption is often used to protect data.

- (a) Discuss the need for encryption.

[4]

- (b)** Discuss the advantages and disadvantages of using symmetric encryption.

[4]

- 9 A programmer is writing an algorithm in pseudocode to represent a company's payroll system. The system calculates a worker's wages before tax by multiplying the number of hours worked by the rate of pay per hour. A procedure within the main algorithm representing this could be:

```
PROCEDURE BeforeTax(Hours, Rate)
    WagesBeforeTax ← Hours * Rate
ENDPROCEDURE
```

There are two stages involved in calculating the wages after tax:

- the amount of tax paid by the worker is calculated by multiplying the WagesBeforeTax by the rate of tax (35%);
- the amount of tax paid is then subtracted from the WagesBeforeTax.

- (a) Write a procedure for calculating the wages after tax, assuming the value of WagesBeforeTax is passed to it.

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[4]

- (b) The programmer's algorithm will use the BeforeTax() procedure and the procedure created in part (a) to calculate and output the wage after tax for each worker.

Complete the algorithm. The statements have been numbered to help you.

```
1  count ← 0
2  INPUT NumberOfWorkers
3  REPEAT
```

4

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7

8

9 UNTIL

[6]

- 10 Schools often use computerised weather stations to collect data, rather than requiring their students to do it manually.

Discuss the advantages and disadvantages of schools using monitoring technologies rather than students taking readings manually.

[8]

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