



Cambridge International AS & A Level

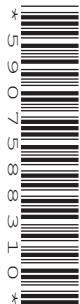
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NAME

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INFORMATION TECHNOLOGY

9626/12

Paper 1 Theory

October/November 2023

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 A company secretary is creating a new database of workers to record:

- their six digit ID number
 - the date they joined the company
 - their rate of pay per hour up to a maximum rate of \$50 per hour.

She has entered data from a source document into the database. There was an error in record 3 and an error in record 4 in the source document. The secretary also made an error when copying record 1.

Source document				Database		
Record	ID number	Date joined	Rate of pay	ID_number	Date_joined	Rate_of_pay
1	147563	13/06/2019	35	147563	13/06/2020	35
2	163459	09/10/2019	28	163459	09/10/2019	28
3	1827697	15/08/2020	31	1827697	15/08/2020	31
4	221524	23/12/2020	56	221524	23/12/2020	56
5	256817	27/07/2021	15	256817	27/07/2021	15

Using this data, explain, in detail, the need for verification and validation when entering data into a database.

[6]

2 Mainframe computers are used in banking. Supercomputers are used in climate research.

- (a) Explain what is meant by a mainframe computer and by a supercomputer with reference to the types of processing and the processors they each use.

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..... [3]

- (b) Explain how supercomputers are used in climate research.

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..... [4]

3 Give brief descriptions of the following types of user interface.

(a) command line interface

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[2]

(b) gesture based interface

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[2]

(c) dialogue interface

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[2]

- 4 (a) Describe how touch sensors are used as part of a control system in nuclear power plants.

[2]

[2]

- (b)** Describe how infrared sensors are used in burglar alarm systems.

[2]

[2]

- 5 Maria wants to use information about the families in her town for a study. She will get the information from an indirect data source, the town's electoral register. This is kept at the local council office. She has decided **not** to use a questionnaire, which is a direct data source, to gather the information she needs.

Describe the suitability of using the electoral register rather than a questionnaire.

[5]

- 6 There can be a digital divide between people who live in rural areas and people who live in urban areas. The divide can be caused by the lack of fast broadband in rural areas, resulting in limited access to the web.

- (a) Explain the effects on people who live in rural areas of having limited access to the web.

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[4]

- (b) Describe ways to reduce this digital divide.

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[3]

- 7 Louisa, a teacher with limited IT knowledge, has created a simple database of her students. The database contains the names of her students and the results of their latest test.

She prints out the names of the students who have passed the latest test by gaining a mark of 40 or more.

When she created the database, she considered creating a dynamic parameter query to produce her printout. However, she decided to create a static parameter query.

Explain why this was a good decision.

[5]

- 8** Students often transfer files between different word processing and database packages.

Justify the need for generic file formats for the transfer of files between different packages.

[8]

- 9 Sukhjinder, a mathematics student, has defined a procedure using pseudocode. It calculates the area of a parallelogram by multiplying the base by the height. All parallelograms will have an area of less than 1000.

The procedure Sukhjinder has written is:

```
PROCEDURE parallelogram(base,height)
area ← base*height
ENDPROCEDURE
```

He has also begun writing an algorithm which calls the procedure and then passes back the area.

The main algorithm accepts inputs of the base and the height of 10 parallelograms, one at a time. It will output the areas of the largest and smallest parallelograms.

Complete the algorithm for Sukhjinder by filling in the missing lines.

```
count ← 0
smallest ← 1000
```

```
WHILE count < 10
    INPUT base, height
```

```
IF area < smallest  
    THEN
```

ENDIF

[8]

10 Explain why the following techniques could be needed when making videos.

(a) trimming a video clip

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[2]

(b) adding subtitles to a video

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[2]

(c) adding sound to a video

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[2]

- 11 When data is sent across the internet, it is usually encrypted.

Discuss the benefits and drawbacks of encrypting data which is transmitted over the internet.

[8]

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