Cambridge International AS & A Level
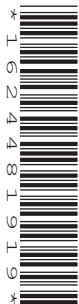
CANDIDATE NAME	

CENTRE NUMBER		CANDIDATE NUMBER	

INFORMATION TECHNOLOGY **9626/11**

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.

[Turn over

1 (a) Describe the features and the role of a primary key in a database.

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(b) Describe the features and the role of a foreign key in a database.

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2 Two methods of checking the accuracy of data are validation and verification.

Describe the differences between validation and verification.

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3 Companies have the choice of using custom written software or using off-the-shelf software.

Explain the differences between custom written software and off-the-shelf software in terms of:

(a) cost

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(b) level of support

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(c) degree of testing.

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4   Explain how HTTPS websites provide security of data.

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5   Compare static parameter queries with dynamic parameter queries. You must include similarities
    and differences.

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6 Most control technology systems use actuators and sensors.

(a) Describe the purpose of an actuator.

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(b) Describe how an electromagnetic field sensor works when used in a car park control technology system.

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(c) Describe how an ultrasonic sensor works when a driver is parking a car.

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7 A company employs workers as:

- labourers who are paid $18 per hour
- office workers who are paid $22 per hour
- managers who are paid $30 per hour.

A computer programmer has written part of an algorithm in pseudocode.
The completed algorithm will calculate and output the wage for each worker.

The inputs will be:

- the number of workers
- the job code for each worker (L for labourer, O for office worker or M for manager)
- the number of hours each worker has worked.

If L, O or M is not entered for the job code then the message 'Invalid job code' will be output. The algorithm will terminate when all the workers' details have been entered. It will use the `CASE...ENDCASE` construct to determine the rate of pay.

Complete the algorithm by filling in the missing lines.

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    INPUT number

    REPEAT

        INPUT jobcode, hours

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            'L' : rate ← 18

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        count ← count + 1

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[8]

8   Explain what is meant by the term 'data driven' within the context of expert systems.

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9   Computer models are often used to run simulations when designing a nuclear power plant.

(a) Describe the benefits of using simulations in this scenario.

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(b) Describe the drawbacks of using simulations in this scenario.

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10 A school stores all the records of its students in alphabetical order. Records could be found using sequential access.

(a) Explain what is meant by sequential access.

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The school decides to use the indexed sequential method to search for the records of individual students. An index table contains all the letters of the alphabet in alphabetical order.

(b) Describe how the details of a student called Johnsen would be found.

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11 A company receives orders which are entered into a computer system. The company has decided to use online processing to process these orders so employees enter orders as they are received.

Discuss the advantages and disadvantages of using online processing compared to using batch processing in this scenario.

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12 Analyse the effectiveness of supercomputers.

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