Cambridge Assessment International Education

Cambridge International AS & A Level

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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2600220212

INFORMATION TECHNOLOGY **9626/13**

Paper 1 Theory **May/June 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.

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1 Describe what is involved in data logging.

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2 Explain the purpose of the SSL/TLS protocol.

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3 There are different types of processing including batch processing and real-time processing.

(a) Without referring to master files and transaction files, describe what is meant by batch processing.

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(b) Rocket guidance systems are used in space exploration.

Explain why a rocket guidance system is an example of the use of real-time processing.

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4 One of the functions of an operating system is to maintain the security of a computer system.

Describe the **other** functions of an operating system.

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5 Justify the use of Information Technology for monitoring the environment.

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6 A computer-controlled traffic light system controls the flow of motor vehicles and pedestrians.

Describe the inputs, processing and outputs involved in this system.

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7 Explain the reasons for the digital divide between the old and the young.

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8 Spyware is a type of malware.

Describe the consequences to the individual of the use of spyware on their computer.

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9 Discuss the advantages and disadvantages of using a gesture-based user interface rather than a graphical user interface to control devices.

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10 An expert system is being trialled for use as part of a study on animal identification. It has been set the following task.

The goal is to decide the colour of a bird named Hortense.
Two facts are provided:

- she sings
- she is 15 cm tall.

The rule base contains the following three rules:

- IF X is an ostrich – THEN X has a long neck
- IF X sings and X is 15 cm tall – THEN X is a canary
- IF X is a canary – THEN X is yellow

The inference engine has concluded that Hortense is yellow. It has taken the facts as data and used the rules base to decide:

1 Hortense is a canary
2 Hortense is yellow

(a) Identify which type of chaining the inference engine used.

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(b) Explain the reasoning the inference engine used.

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11 In Ruritania these are the tax rules.

- People who earn up to $10 000 pay no tax.
- People who earn between $10 000 and $40 000 pay 20% tax on their earnings **above** $10 000.
- People who earn more than $40 000:
  pay $6 000 ($30 000 × 20%)
  and pay 40% tax on their earnings **above** $40 000.

Complete this flowchart which shows how the net wage (the money earned after tax is paid) is calculated and is output for an individual in Ruritania.

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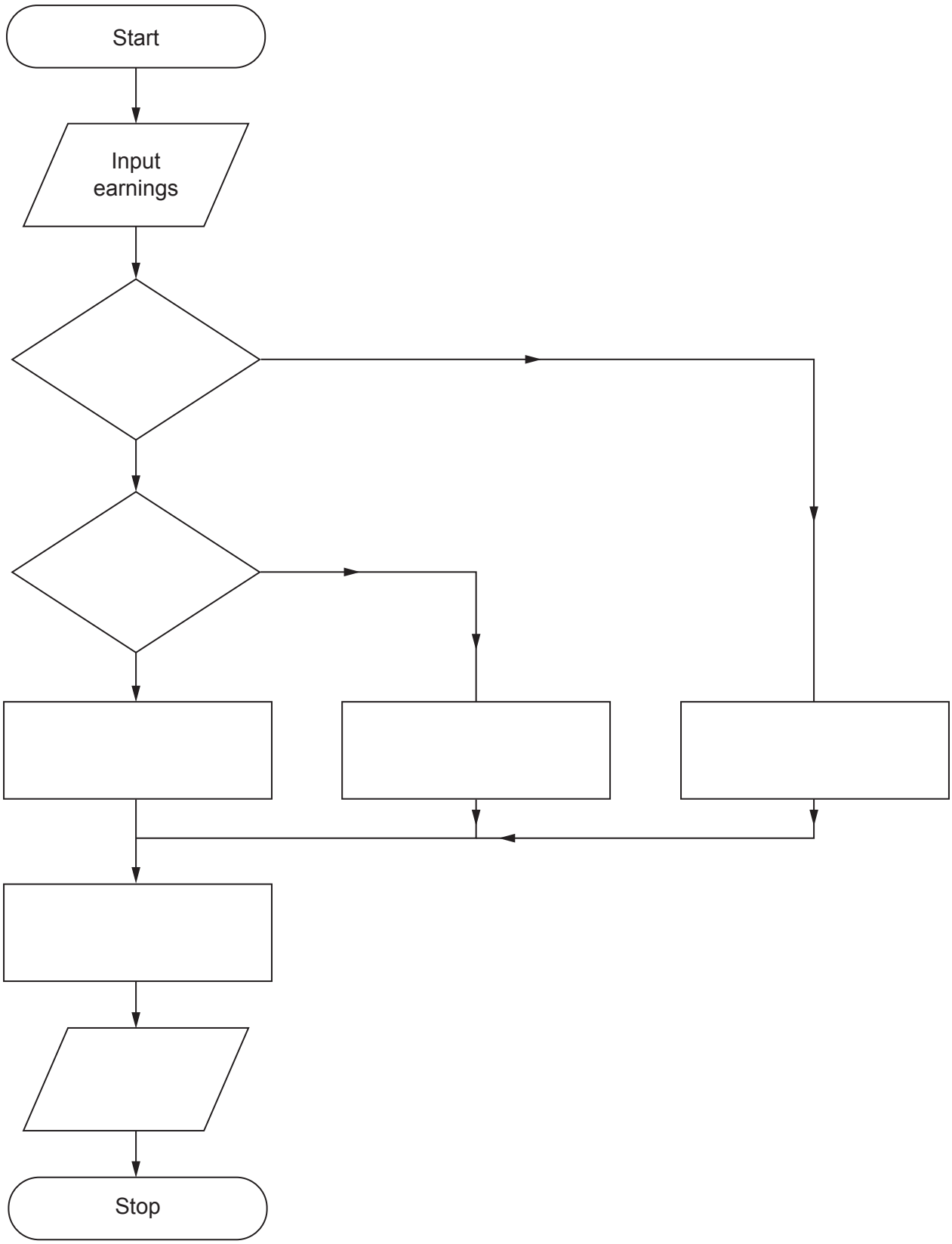

[8]

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