Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

2285009255

INFORMATION TECHNOLOGY **9626/31**

Paper 3 Advanced Theory **May/June 2018**

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Calculators are not allowed on this paper.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

Any businesses described in this paper are entirely fictitious.

DC (SC/SG) 152977/2

CAMBRIDGE International Examinations

1 A company stores details of its customers in a database which is to be used as the source file for a mail merge. A letter, created as the master document, is to be sent to all the customers by post or by email. The company prefers to send the letter by email. However, letters will be sent by post if the company does not have a current email address for the customer in its database.

Describe how a mail merge field in the master document can be set up to exclude those customers whose email address is not stored in the database.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

2 JavaScript defines a number of primitive data types.

(a) Explain the term 'primitive' when used in this context.

.....

.....

.....

.....

.....[2]

(b) Describe **three** primitive data types used in JavaScript.

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

.....[3]

3 Variables are used in JavaScript to hold values.

Explain how a variable is created in JavaScript code.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

4 As part of a project to create a new software application, a system analyst will produce a software requirements specification and a user requirements specification.

(a) Describe the contents of a software requirements specification for the new software application.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

(b) Describe the purpose of a user requirements specification for the new software application.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

(c) Give **one** reason why the user requirements specification might prove to be inaccurate.

.....

.....

.....[1]

5 Discuss the benefits and drawbacks of the use of satellite technology in global positioning systems (GPS).

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[8]

6 Tamsin is evaluating CPU hardware for use in a new tablet computer. She uses the charts in Fig. 1 to help her make a decision between using CPU 1 or CPU 2 in the new tablet.

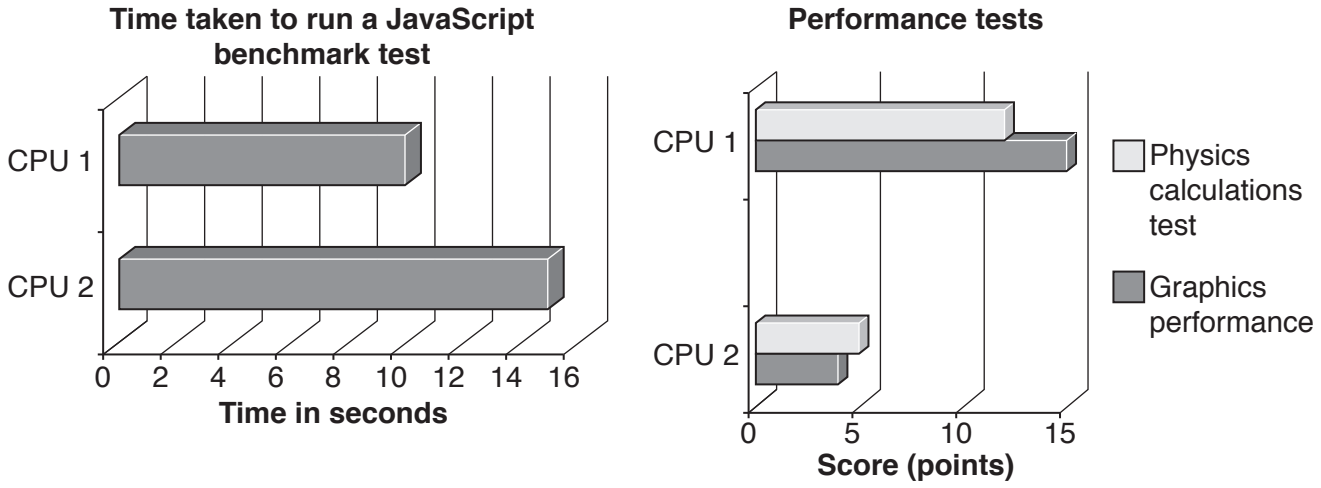

Fig. 1

Identify, with reasons based on the information in Fig. 1, the most suitable CPU for Tamsin to use in the new tablet computer.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[5]

7 Cynthia has created a database to store details of her friends in the UK and wants to include their home addresses. She will create a validation routine to check that the UK postcode of their address is in a valid format when it is entered into the database.

UK postcodes must have an outward code and an inward code separated by a single space. The outward code is made up of the postal area and the postal district. The inward code also has two parts: the postal sector and the postal unit. A typical UK postcode is CB1 2EU.

The whole postcode conforms to a format as shown by the examples in Fig. 2.

	UK Postcode Formats				
	Outward Code		**Inward Code**		
	Area	**District**	**Sector**	**Unit**	**Written as:**
Example 1:	CB	1	2	EU	CB1 2EU
Example 2:	SW	1A	1	AA	SW1A 1AA
Example 3:	SW	1A	0	AA	SW1A 0AA
Example 4:	CV	4	8	JQ	CV4 8JQ

Fig. 2

Using the information given above, describe what the validation routine would have to do in order to check that the entered postcode was in a valid format.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[6]

8 Discuss the advantages and disadvantages of carrying out research into an existing computerised stock control system using the analysis of existing documents.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[8]

9 A graphics artist has drawn a shape on a 600 × 800 pixel resolution grid as shown in Fig. 3.

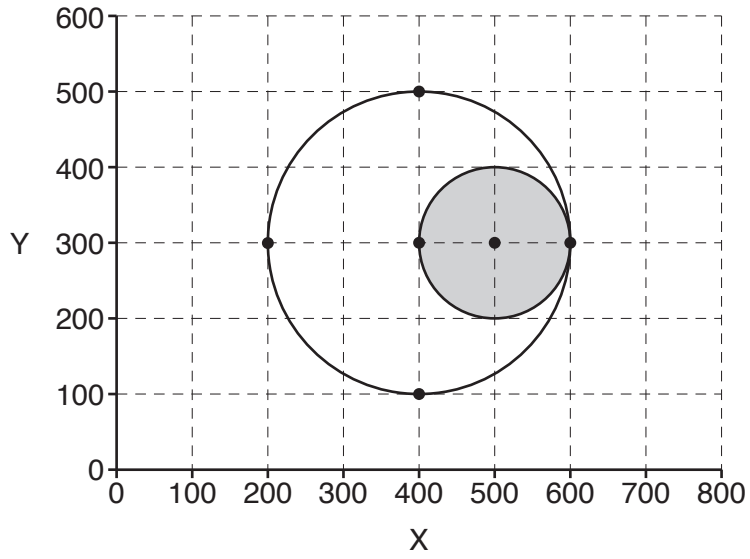

Fig. 3

The shape is to be stored in a computer file as a vector graphic so that it can be opened and displayed in different resolutions without loss of quality.

Describe the information about the shape that would be stored in the vector graphic file.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[6]

10 A large school is creating a relational database to store details of pupils and teachers. Examples of the data to be stored are shown:

Pupils:	Orlando Albert Sockett Born: 22 October 1999 Studies: English, Mathematics, Science	Teachers:	Christopher Wallace Based in Room 27 Teaches English

Using the information given, create a data dictionary in the table to list the entities and attributes of the new database:

Entity	Attribute	Data type	Field size

[8]

[Turn over

11 An automatic washing machine has a number of wash cycles controlled by an embedded computer system. The system can accept inputs to vary the temperature and spin speed. It also has 'start' and 'stop/cancel' buttons.

When the 'start' button is pressed the system checks, in this order:

- that the door is properly closed
- the temperature has been set by the user
- the spin speed has been set by the user
- if the load is either a 'full load' or 'half load' of washing.

The washing cycle will automatically stop if the set time has been reached or the 'stop/cancel' cycle button is pressed.

A section of the control sequence is shown in the flowchart in Fig. 4. Some flowchart labels are missing.

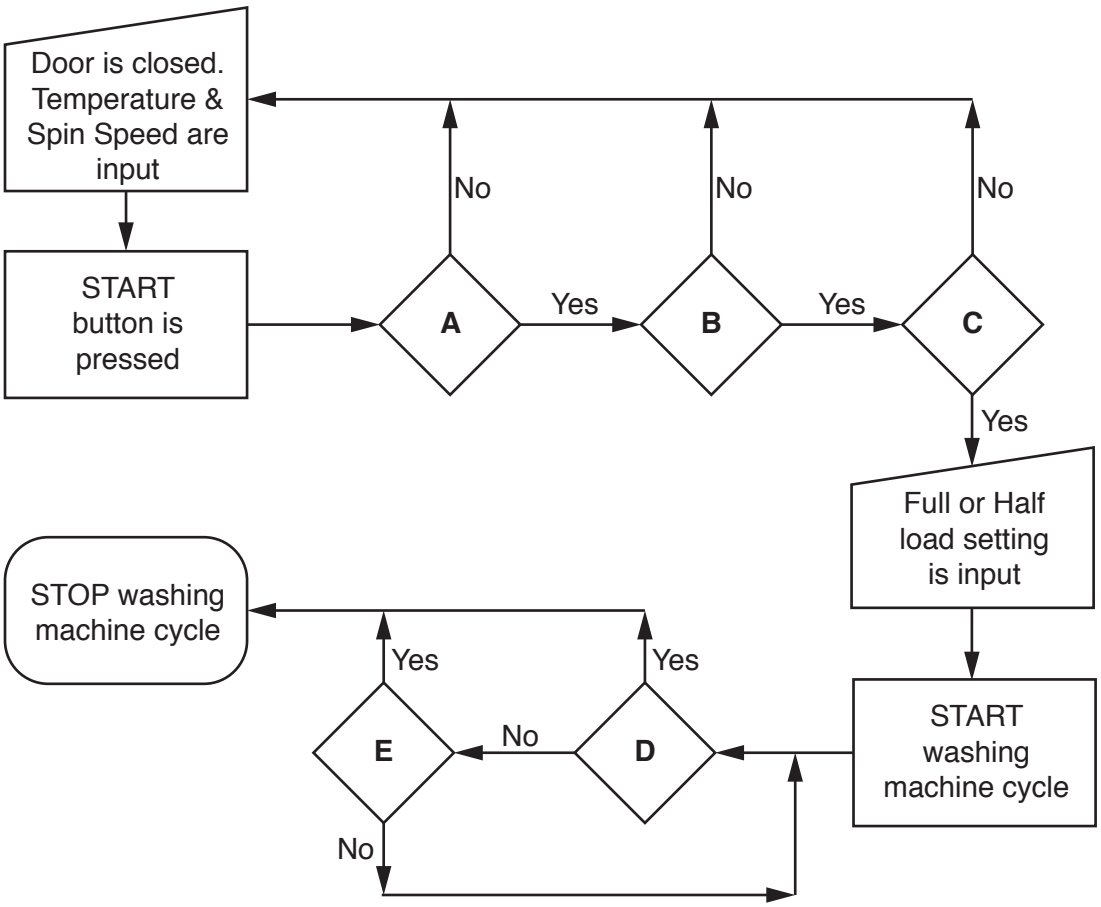

Fig. 4

Complete the table below to describe how the embedded computer system controls the washing machine at **A**, **B**, **C**, **D** and **E**.

Position in flowchart	What is happening at the position
A	
B	
C	
D	
E	

[5]

[Turn over

12 The networking of computers can give rise to a variety of issues.

Describe each of the following security issues and suggest how, other than using physical security methods, the risk from each may be reduced.

(a) DNS spoofing.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[5]

(b) DoS attack.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[5]

(c) ARP spoofing.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

PLEASE TURN OVER FOR QUESTION 13.

13 Companies use a range of physical security methods to try to prevent unauthorised access to the company data stored on their networks.

Evaluate the use of physical security methods in attempting to prevent unauthorised access to the stored data.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[8]