Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER					

5530727077

INFORMATION TECHNOLOGY **9626/33**

Paper 3 Advanced Theory **October/November 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 must not be used 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.

This document consists of **17** printed pages and **3** blank pages.

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1 The photograph shown in Fig. 1 was taken and manipulated into the JPEG image shown in Fig. 2.

Fig. 1

Fig. 2

(a) Describe all the software features used to change the image in Fig. 1 to produce the image in Fig. 2.

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(b) Explain why the features of the face in Fig. 2 are no longer easy to see.

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2 An office area has an air conditioning system. The user guide for the system contains a troubleshooting flowchart that users can follow if the air conditioning is not working properly. The flowchart is shown in Fig. 3.

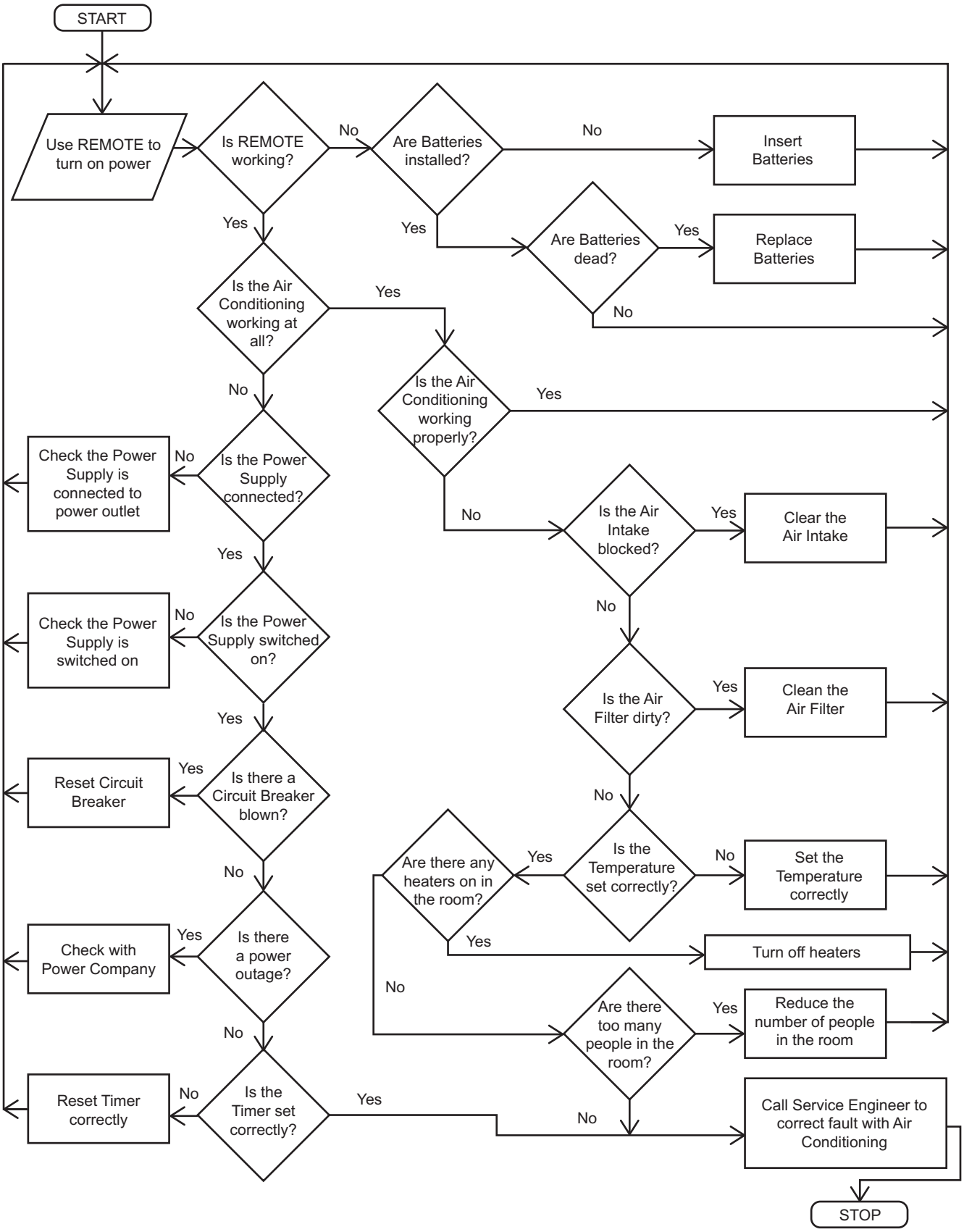

Fig. 3

The flowchart is considered to be too complex to follow quickly.

Using the information in the flowchart, redesign the troubleshooting guide by completing the table below with statements of instructions so that it is more easily understood. Some sets of instructions have been done for you.

Symptom	**Items that must be checked**
If, after checking the items below, the air conditioning still does not work, call the service engineer.	
The remote control does not work	*Check the batteries in the remote control are installed.*
	Check the batteries in the remote control are working.
The air conditioning does not work at all	
The air conditioning is not working properly	

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3 Evaluate the use of Bluetooth® wireless technology for communication between devices.

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4 Industrial robots are used to position and fit a windscreen to a new car during a car assembly process.

Describe ways in which the necessary positional and procedural data could be 'taught' to the robot so that the windscreen is correctly fitted to the car.

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5 JavaScript can be embedded in the code of web pages to add interactivity to a page.

Explain what is meant by the following terms when they are used in JavaScript:

(a) an array.

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(b) a variable.

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(c) a function.

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(d) a comment.

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(e) an object.

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(f) an expression.

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6 A company selling goods online has a network which is configured to allow its web server, FTP server and email server to be accessible from the internet. The company was concerned that the network configuration exposed the whole LAN to security risks so has attempted to improve security by altering the configuration from that in Fig. 4 to the configuration shown in Fig. 5.

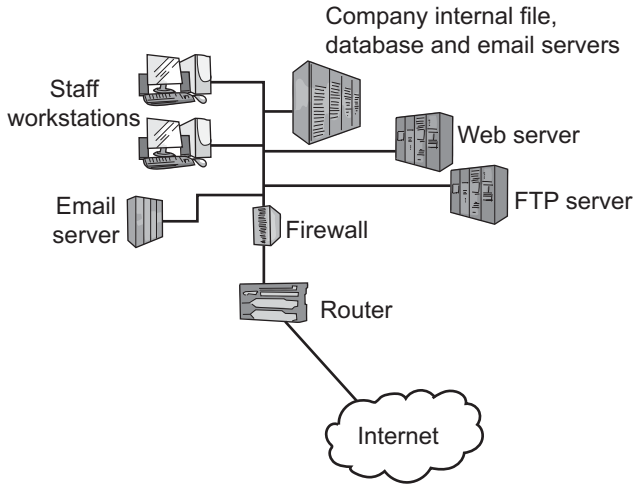

Fig. 4

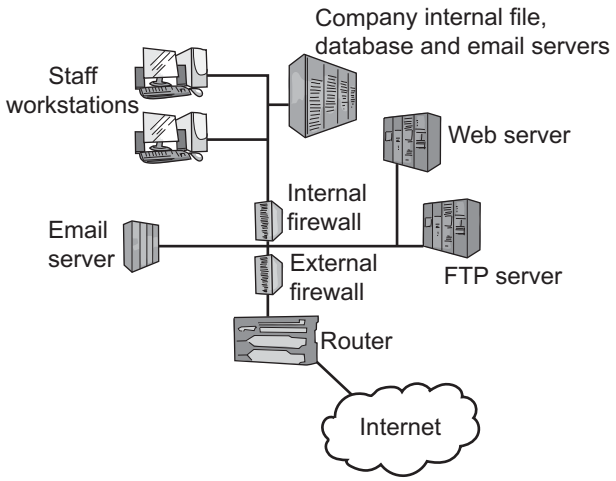

Fig. 5

(a) Explain how the network configuration has been altered in order to maximise security of the company file servers while still allowing access to the other services from the internet.

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(b) Explain, using the information from Fig. 5, why the additional firewall provides more security for the company network.

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7 **(a)** Describe what is meant by web-conferencing.

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(b) Describe how web-conferencing is made possible by internet technologies.

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8 A research and development (R&D) department of a company develops expensive goods. The development process has to be kept secret. The biometrics of all staff of the company are to be measured and used to restrict entry via the doors to the department.

A comparison of the suitability of various biometric methods that are available for use to identify staff has been compiled and is shown in Fig. 6. Each aspect of the biometric method has been rated High (H), Medium (M) or Low (L).

Biometric method used to identify a member of staff	**How universal amongst staff members?**	**How unique is the measurement amongst staff members?**	**How permanent is the measurement to staff members?**	**How easy to collect at door from staff?**	**How acceptable to staff?**	**How resistant is the method to circumvent by staff?**	**Performance rating of the biometric method**
Face	H	L	M	H	H	L	L
Fingerprint	M	H	H	M	M	H	H
Hand shape/ geometry	M	M	M	H	M	M	M
Veins in hand	M	M	M	H	H	H	M
Iris	H	H	H	H	H	H	H
Retina	H	H	M	L	L	H	H
Voice of staff member	M	L	L	M	H	L	L
Facial thermogram of staff member	H	H	L	H	H	H	H
DNA of staff member	H	H	H	L	L	H	H

Key: H = High M = Medium L = Low

Fig. 6

Use the information in Fig. 6 to choose, with reasons, the biometric measurements that would be most suitable for measurement at the door.

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9 **(a)** Describe the benefits to students of using online tutorials.

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(b) Give **two** reasons why a student might not be able to use online tutorials.

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10 Social networking has led to a reduction in meeting face to face.

Discuss the ways that social networking has changed social patterns.

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11 Computer-aided manufacture (CAM) can be used in the production of a computer motherboard.

Analyse the use of CAM.

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12 Analyse the use of project scheduling tools to organise a project to create a road bridge.

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