MODULE H SOFTWARE · H7

# Firmware, the bootloader and how software layers run

Original practice questions · 20 marks · ~25 minutes · Cambridge 0478 syllabus 4.1.3 (with 3.3.1)

Name _____ Date _____

**Instructions.** Answer all questions in the spaces provided. The marks for each part are shown in brackets [ ]. Do not give brand names of software or hardware. The total for this worksheet is **20 marks**.

## 1

**Total: 4 marks**

A firm of architects uses desktop computers in its office. Staff use a drawing application on each computer to produce plans of buildings.
The diagram shows the layers that are needed to run the drawing application. Each layer is run on the layer directly below it.

**(a)** Complete the diagram by writing the name of the missing layer in each empty box. **[3]**

| | |
|---|---|
| | top layer |
| | |
| | |
| **Hardware** | bottom layer |

**(b)** State the name of the firmware that is run on the hardware when a computer is switched on and that loads the operating system. **[1]**

## 2

**Total: 5 marks**

The firm's IT technician writes some statements about the software on the office computers.

**(a)** Tick (✓) **one** box in each row to show whether each statement is true or false. **[5]**

| Statement | True (✓) | False (✓) |
|---|---|---|
| The bootloader is a type of firmware. | | |
| The drawing application is run on the operating system. | | |
| The bootloader is run on the operating system. | | |
| Firmware is lost when the computer is switched off. | | |
| The operating system is run on the firmware. | | |

**3** **Total: 3 marks**

On each office computer, the bootloader is stored in read only memory (ROM).

**(a)** Explain why the bootloader is stored in ROM and **not** in random access memory (RAM). **[3]**

**4** **Total: 3 marks**

The technician finds that the bootloader on one computer has been corrupted. All the hardware in that computer is working correctly.

**(a)** Explain why staff cannot use the drawing application on this computer. **[3]**

**5** **Total: 5 marks**

An architect switches on a working office computer and then opens the drawing application.

**(a)** Describe how the hardware, the firmware and the operating system are all needed for the drawing application to run on this computer. **[5]**

**Total for this worksheet: 20 marks**