Name: Class:

Task 1

For each of the following computer related terms in the table below, tick to indicate if they are an application, operating system, user or hardware.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Application** | **Operating system** | **User** | **Hardware** |
| **Excel** | 🗸 |  |  |  |
| **Android** |  | 🗸 |  |  |
| **Programmer** |  |  | 🗸 |  |
| **Mouse** |  |  |  | 🗸 |
| **Android** |  | 🗸 |  |  |
| **iOS** |  | 🗸 |  |  |
| **Microsoft Word** | 🗸 |  |  |  |
| **Windows** |  | 🗸 |  |  |
| **IT technician** |  |  | 🗸 |  |
| **Ubuntu** |  | 🗸 |  |  |
| **Google Chrome** | 🗸 |  |  |  |
| **CPU** |  |  |  | 🗸 |
| **RAM** |  |  |  | 🗸 |

Task 2

(a) Choose **two** different operating systems that you have used.

**Operating system 1:**

**Operating system 2:**

(b) Compare both these operating systems. You may need to use the Internet to research your chosen operating systems further. Consider the following points in your comparison:

* What hardware and devices does it work with?
* Who makes it?
* What features does the Graphical User Interface (GUI) provide?
* What are the feature differences between the two operating systems?
* Can the operating system run programs made for the other operating system?
* What other features do the operating systems provide that the user doesn’t necessarily see or realise are there?

Task 3

1. Faraday is a new car company. As with all modern cars they will be incorporating a small computer called an electronic control unit (ECU). This will control devices such as the brakes, engine performance and electric windows. For example, when the brakes are pressed the brake lights must be switched on within 0.05 seconds.

(a) What type of operating system would be chosen for the ECU?

(b) Describe how the following are controlled by the ECU and its operating system.

(i) Speed control / cruise control

(ii) Antilock braking system (ABS)

(c) Explain what happens if the ECU is delayed in carrying out operations of both speed control and ABS.

**Speed control:**

**ABS:**

Task 4

Zahra set up and runs a multinational perfume company. The perfumes are produced by machines that need to combine ingredients in correct proportions and at exact temperatures.

The workers in the manufacturing facility each have a small hand-held device which is used to monitor data provided by sensors in the machines. Sales employees each have tablets they use whilst they are visiting shops and buyers.

The company head office is in Paris. Employees there make use of ‘thin client’ computers. These are very simple computers which connect to a server which does most of the work, such as running programs and storing data.

(a) Suggest, giving reasons, the types of operating systems that should be selected for:

(i) The manufacturing machines.

(ii) The small, hand-held devices.

(iii) The employees’ tablets.

(iv) The server at head office which allows ‘thin clients’ to connect.

(b) Many computers have only one CPU and can only carry out one instruction at a time. These computers, with operating system support, are still able to carry out many tasks at the same time. For instance, a user of a mobile phone could be listening to music, whilst browsing a website, whilst still able to receive voice calls and text messages. This is due to multi-tasking.  
  
Explain how multi-tasking works.

Task 5

Three tasks that operating systems are responsible for are:

* Network management
* Security
* Device drivers

1. Choose **two** different operating systems.

**Operating system 1:**

**Operating system 2:**

Explain how each of the tasks are carried out by the operating system. Find examples or images to illustrate these from the two operating systems you have selected.

Task 6

Modern operating systems are responsible for both memory management and virtual memory.

Adapt the diagram below to explain how an operating system manages loading a web browser to browse a web page, and what happens if too many web pages or tabs are opened.

**RAM**

|  |
| --- |
| **Operating  system** |
| **Browser** |
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Hard Disk

CPU

Network Interface Card (NIC)