

CHAPTER 5 Engineering applications of IT and ICT

Test your knowledge 5.1

A typical answer might be:

The CPU manages the computer system by carrying out tasks such as:

- fetching, decoding and executing program instructions
- performing mathematical operations such as addition and subtraction
- carrying out logical operations such as AND and OR.

Test your knowledge 5.2

- Screens and other displays **Output**
- Keyboards for inputting text, numbers and other characters **Input**
- Pointing devices such as mice or trackballs **Input**
- Printers to provide hard copy output **Output**
- External drives for storing large amounts of data **Input and output**
- Routers to provide network access. **Input and output**

Test your knowledge 5.4

Any three from the following (or similar):

- Domestic central heating controllers
- Heating, ventilation and air conditioning
- Laser printers, 3D printers and plotters
- Electronic engine controllers
- Electronic weighing machines
- CNC machines.

Test your knowledge 5.5

A typical answer might include any three of the following:

Speed of processing

Microcontrollers usually need to operate at relatively slow speeds while desktop computers must operate at high speeds so that they can quickly manipulate large amounts of data.

Memory

Because their use is restricted to a few simple tasks, a microcontroller requires only a relatively small amount of memory to store its programs and data. A desktop computer needs significantly more memory in order to store a variety of different software applications as well as large amounts of data.

Physical size

Microcontrollers are usually built into products and need to be as small as possible. Desktop computers require more space because they offer a wider range of functions and the motherboard (on which the CPU, memory devices and other chips are mounted) is usually relatively large.

Power supply

Desktop computers require a mains power supply capable of delivering low voltages at appreciable current to the CPU and other devices, such as hard disk drives. Microcontrollers, on the other hand, require only relatively small currents and in some applications may derive their supplies directly from batteries.

Cost

Microcontrollers are relatively simple and inexpensive (cost less than £50). Desktop computers are relatively complex and expensive (cost more than £250).

Test your knowledge 5.8

A typical answer might include any three of the following:

Word processing – for viewing and editing documents

Spreadsheets – for storing, manipulating and analysing numerical data

Database – for storing, searching and reporting data

Graphics – for creating, editing and viewing graphical images

CAD – for creating, editing and viewing engineering drawings.

Test your knowledge 5.9

- (a) Hypertext transfer protocol
- (b) Hypertext mark-up language
- (c) Internet protocol
- (d) Internet service provider
- (e) Uniform resource locator.

Test your knowledge 5.10

A web browser (such as Internet Explorer, Google Chrome, Firefox and Opera).