Module 3 / Using Computer Hardware

**1. What type of component provides persistent storage?**

A mass storage device such as a Hard Disk Drive (HDD), Solid State Drive (SSD), or flash memory. You could also mention optical discs (CD, DVD, Blu-Ray).

**2. What computer component is most restrictive in terms of determining upgrade**

**potential for a desktop computer?**

The motherboard—it is difficult and expensive to replace.

**3. True or false? A plug-in card is always required to support PC sound.**

False—sound functions are often provided by the motherboard chipset.

**4. What is the main advantage of using a CPU in 64-bit mode?**

Makes more system memory accessible. A 64-bit CPU and OS is also required to run 64-bit applications, but there are not too many of these yet. 64-bit software is more reliable and a bit faster than 32-bit software.

**5. What is a typical speed for a modern CPU to run at?**

Around 2 GHz; budget models might run as low as 1 GHz while the fastest run up to about 3 GHz.

**6. You want to purchase a computer with a fast graphics interface. What type of**

**expansion slot should you look for?**

PCIe x16—this is a type of PCI Express slot that uses 16 'lanes'. Each lane can transfer 250 MBps (or 500 MBps for PCIe 2 and 1 GBps for v3).

**7. What type of component provides a passive cooling solution?**

A heatsink or heat spreader removes heat from the component by convection with no power required. However, it is usually necessary to cool the heatsink or heat spreader itself and this is likely to require active cooling (a fan).

**8. How would you access the system setup program on a PC?**

Historically, by pressing the appropriate key during startup (ESC, DEL, F1, F2, or F10). Modern PCs often use fast boot modes that require some other means of booting to the firmware setup program.

**Review Questions / Module 3 / Unit 2 / Using Device Interfaces**

**1. True or false? Mice and keyboards must be connected to a computer via PS/2 ports.**

False—they are now much more likely to use USB or wireless (Bluetooth or other RF) interfaces.

**2. True or false? USB cables have the same connectors at either end.**

Partly false—the connectors for the host (PC) and device use different form factors (there are also normal size and mini or micro device connectors). A new reversible Type C connector is starting to be used however.

**3. A user has two USB drives connected to her PC. She complains that when she copies**

**large files to both drives at the same time, it seems to take much longer. Why might**

**this be?**

Bandwidth on the USB bus is shared between all devices.

**4. You want to purchase a flat-panel monitor that can show widescreen movies. You are**

**considering models with native resolutions of 1400x1050 and 1920x1200. Which**

**should you choose?**

1920x1200 as this is a widescreen format.

**5. True or false? HDMI is the only type of display interface that supports High Definition**

**picture resolutions.**

False—there is also DisplayPort and Thunderbolt and some DVI formats also support HD resolutions.

**6. You are considering buying a new display device. The model you are considering**

**accepts digital inputs only. Your computer's graphics adapter has a blue port with 15**

**holes. Would this flat-panel be a wise purchase?**

Probably not, as this connector is VGA, which supports analog output only. It is possible to buy converters however.

**7. You need to configure settings for an input device. What should be your first step?**

Open the Settings app or Control Panel.

**8. A friend is asking for your help in using her computer. When he presses the key**

**marked @, a different symbol appears. What could be the cause?**

The keyboard is set to use a UK layout—you can correct this using the Language Bar.

**9. What type of mouse would you recommend for someone who uses their computer**

**principally to play computer games and why?**

Laser mouse—this registers cursor movements more quickly and accurately.

**Review Questions / Module 3 / Unit 3 / Using Peripheral Devices**

**1. Which Windows interface is used for advanced management and troubleshooting of**

**devices?**

Device Manager is used to update drivers and obtain more advanced troubleshooting information. The basic user interface is either Devices and Printers or the device pages in the Settings app, depending on the Windows version.

**2. What do you need to know to connect to a device that is configured over the network?**

Typically the Internet Protocol (IP) address of its management page. Some devices may use a name to locate the page instead. You are also likely to be prompted for a user name and password.

**3. True or false? If you want to configure the DPI of a display device, you would do so via the**

**Personalization app.**

False—Dots Per Inch (DPI) or scaling is configured via Display properties. Personalization is for configuring themes and the appearance of the desktop.

**4. You are configuring dual monitors positioned side-by-side. You want to increase the amount**

**of screen space available. Which multiple display option should you set?**

Extend the displays.

**5. You need to plug a microphone into a computer to make a recording. How would you**

**identify which jack to use?**

The jack should be color-coded (pink). There may be an icon to represent usage though. If neither is present, check the system documentation.

**6. What, if any, type of printer uses a fuser?**

Laser printer—the fuser bonds the toner to the surface of the paper using high heat and pressure.

**7. What are the four inks used to produce color prints?**

Cyan, Magenta, Yellow, and Black (CMYK).

**8. What type of wired interface is a printer MOST likely to use?**

Universal Serial Bus (USB).

**9. You want to configure a printer to use both sides of the paper (duplex) by default. You have**

**alt-clicked the printer object—which command should you select to proceed?**

Printing preferences.

**10. What basic command demonstrates that a printer is connected properly to a computer and**

**that its driver is installed correctly for Windows?**

Print Test Page.

**11. What function of a scanner would you use if you want to convert a letter that someone has**

**mailed to you into a computer-editable document?**

Optical Character Recognition (OCR).

**12. True or false? If your PC does not have a flash memory card reader, you should be able to**

**connect the camera itself to the PC over USB to copy images off the card.**

True—must cameras support USB connections.

**Review Questions / Module 3 / Unit 4 / Using Storage Devices**

**1. You have a motherboard that is designed for DDR2 memory that works at a bus**

**speed of 533 MHz. You have some DDR3 memory modules that also work at a bus**

**speed of 533 MHz. Are the modules compatible with the motherboard?**

No—DDR3 modules cannot be used in DDR2 slots.

**2. Why can't you use memory modules designed for a desktop computer in a laptop?**

Laptops use a smaller form factor called SO-DIMM while desktops use DIMMs.

**3. A hard drive is rated at 10,000 RPM. What is the significance of this statistic?**

The number of revolutions per minute (RPM) is one of the basic factors determining the speed of the drive. 10,000 rpm represents good performance (15K rpm is the best available).

**4. What type of connector would you use for an external hard drive to connect to a**

**Windows PC?**

USB. Firewire, eSATA, or Thunderbird are also possible but not nearly so popular. Most drives are now USB3 or USB3.1. Note that you can plug a USB3 drive into a USB2 port, so long as you have a USB3 device cable.

**5. Your computer has 4 SATA ports. How many hard drives can be installed?**

Four—each SATA port can be used to connect one drive.

**6. True or false? A single layer Blu-ray Disc has greater capacity than a dual-layer,**

**double-sided DVD.**

True—the capacity of a single layer Blu-ray disc is 25 GB compared to 17 GB for a dual-layer, double-sided DVD.

**7. What sort of device would you need to transfer data from a "Memory Stick?"**

Memory card reader/multi-card reader. Do note that Memory Sticks are no longer in production so you could struggle to locate a suitable reader.

**8. What sort of device could you use to expand the storage capacity of a smartphone?**

Flash memory card.

**Review Questions / Module 3 / Unit 5 / Using File Systems**

**1. In Windows, you can access data via letter-labeled "drives." Do these correspond**

**exactly to physical disks?**

Not necessarily in the case of hard disks, which can be configured with multiple partitions, each of which can be assigned a drive letter. Optical drives and flash memory cards cannot be partitioned however.

**2. What type of file system must the partition that Windows files are installed on use?**

NTFS.

**3. What default installation folders contain system and application files that should not**

**normally be deleted or modified manually?**

The 'Windows' and 'Program Files' folders.

**4. What is the file path to the Documents folder for a user named "David," assuming**

**Windows is installed to a hard disk with a single partition using the default settings?**

C:\Users\David\Documents

**5. How is a Windows library different from a folder?**

A library acts as a virtual folder by displaying the contents of multiple folders, which could be located on different drives.

**6. If you have made changes to a file and want to keep both the original file and the**

**modified version, what command should you use?**

Save As.

**7. Why should you be more careful about deleting files from a USB flash drive than**

**from the main hard drive?**

The files will not be recycled so there is no possibility of retrieving them if you change your mind (at least, not without using specialist data recovery software).

**8. What view options could you use to show files of a particular type sorted by date?**

Group the files by file type then sort by date.

**9. What kind of data would you expect to find in a file with a TIFF extension?**

This is an image file format.

**10. What is a zip file?**

A file archive containing other files in a compressed format.

# Module 3 / Summary

### Module 3 / Unit 1 / System Components

* CPU performance is measured by a combination of its clock speed and internal architecture. Multiple CPUs (SMP) or multi-core CPUs (CMP) represent another way to boost performance. Most new CPUs can work in 32- or 64-bit mode; 64-bit mode allows for much larger amounts of system memory but there are currently not many 64-bit software applications.
* The amount of system memory affects the ability of the computer to open multiple applications and work efficiently with larger files. The main types of memory are SDRAM and DDR/DDR2/DDR3/DDR4, packaged in DIMM modules for desktops or SO-DIMM modules for laptops.
* The motherboard determines the compatibility of all the other components (including CPU, memory, storage devices, and support for expansion cards). The motherboard chipset provides memory and I/O controllers plus any integrated peripherals (such as sound and video) and ports (such as USB, parallel, serial, and network). The chipset and connectors provide support for different I/O bus standards (PCI, PCIe, and AGP).
* The motherboard can be configured using the low-level firmware (BIOS or UEFI) setup program.

### Module 3 / Unit 2 / Using Device Interfaces

* You learned about the various interfaces used to connect peripheral devices to computers. Most PCs and laptops use USB (and to a lesser extent Firewire). Computers can also use wireless Bluetooth links for peripheral devices. Make sure you learn the characteristics and capabilities of these interfaces.
* Make sure you can distinguish the types and features of input devices and their configuration settings, usually accessed via Control Panel or the Settings app.
* The display signal is generated by the graphics adapter, which will determine the supported resolution, color depth, and special effects capabilities of the system. There are a number of display connectors, including VGA (analog) and DVI/HDMI/DisplayPort (digital).
* Local network (Ethernet) connections are made using a cable connected to the RJ-45 port. Modem cables for the fax function of a compatible printer are connected via an RJ-11 port. The RJ-11 port is also used with DSL Internet services.

### Module 3 / Unit 3 / Using Peripheral Devices

* Devices interface with the system using a device driver. Devices and Printers and Device Manager provide tools for verifying and configuring devices. You can use them to update drivers, check device properties, and enable/disable devices.
* Most computers use flat-screen displays but be aware that these now often come with touchscreen capability. Computers can also use alternative displays, such as projectors.
* Multimedia devices allow for audio recording and playback and video recording. Audio ports come in different sizes and types to allow the connection of equipment such as microphones and speakers.
* Printers for home and office use are usually either based on a laser print process or an inkjet print process.
* Printers use standard peripheral connections (typically USB or wireless/Bluetooth) and can also be connected via a wired or wireless network.
* Printer installation is quite straightforward, but make sure you know how to access the different configuration options and printing preferences. Similarly, learn the output options for scanners.

### Module 3 / Unit 4 / Using Storage Devices

* Computers use system memory (RAM) for fast but volatile storage. Mass storage devices such as HDDs and SSDs provide persistent storage when the computer is turned off.
* A number of types of removable drive and media provide extra storage capacity, backup, and data transfer. Some examples include CD/DVD/Bluray Disc (read-only, recordable, and rewritable) and flash memory (memory cards, and USB drives). Make sure you know the characteristics and capacities of these storage devices.

## Module 3 / Unit 5 / Using File Systems

* Hard disks can be divided into a number of partitions and each partition must be formatted to make a drive accessible under Windows. Each partition can be assigned a drive letter.
* Windows creates three main folders during installation: Windows, Program Files, and Users. Each profile stored in Users is divided into a number of subfolders for different types of file.
* Files and folders can be managed using File Explorer. Files are associated with applications using a period plus three-character extension on the end of the file name.
* Files also have attributes, such as Read-Only or Archive, and permissions that restrict access to authorized users.
* Make sure you can use file search and viewing tools effectively.