# 4. Software

## 4.1 Types of software and interrupts

**1** State **three** features of a typical operating system.

1 .....

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2 .....

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3 .....

.....

[3]

**2** State **four** functions of an operating system.

1 .....

2 .....

3 .....

4 .....

[4]

**3** State **three** functions provided by an operating system.

Function 1 .....

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Function 2 .....

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Function 3 .....

.....

.....

[3]

**4** Personal computers (PCs) use an operating system.

Explain why this type of computer needs an operating system.

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..... [4]

**5** Complete the statements about different types of software.

Use the terms from the list.

Some of the terms in the list will **not** be used. You should only use a term once.

application assembly language bootloader central processing unit (CPU)

firmware hardware operating output system user

..... software provides the services that the computer requires; an example is utility software.

..... software is run on the operating system.

The ..... system is run on the firmware, which is run on the ..... .

[4]

**6** A user has both system software and application software installed on their computer.

**(a)** Describe the difference between system software and application software.

Give an example of each software in your answer.

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..... [4]

**(b)** State which component in the computer would store both types of software when the power is turned off.

..... [1]

**7** Software is installed on a computer to manage files, memory and multitasking.

**(a)** State the name of the software that can do these tasks.

..... [1]

**(b)** Give **one** task that the software allows the user to do to manage files.

..... [1]

**(c)** Describe what is meant by managing memory.

.....

.....

.....

..... [2]

**(d)** A signal is sent within the computer to allow multitasking to occur.

State the name of this type of signal.

..... [1]

**8** The table contains **four** descriptions about a computer system.

Complete the table by writing the correct term for each description.

| Term | Description |
|---|---|
| ..... | A collective term for the physical components of the computer system. |
| ..... | A type of software that provides services that the user requires and allows the user to perform tasks on the computer. |
| ..... | A type of software that manages the main functions of the computer, including managing files and managing memory. |
| ..... | A type of software that is stored in the read only memory (ROM). It includes the basic input output system (BIOS) and the bootloader. |

[4]

**9** An interrupt is a type of signal that is used in a computer.

**(a)** State the name of the type of software that manages interrupts.

..... [1]

**(b)** Describe how interrupts are used when a key is pressed on a keyboard.

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..... [5]

**(c)** Interrupts can be hardware based or software based.

A key press is one example of a hardware interrupt.

**(i)** Give **two** other examples of a hardware interrupt.

1 .....

.....

2 .....

.....

[2]

**(ii)** Give **two** examples of a software interrupt.

1 .....

.....

2 .....

.....

[2]

**10** A computer needs firmware and system software to operate.

**(a)** State the purpose of firmware.

.....

..... [1]

**(b)** Give **one** example of firmware.

..... [1]

**(c)** Give **two** examples of system software.

1 .....

2 .....

[2]

**11** A student uses both system software and application software on their computer.

**(a)** Give **one** example of system software.

..... [1]

**(b)** Give **two** examples of application software.

1 .....

2 .....

[2]

**(c)** Describe the difference between system software and application software.

.....

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.....

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..... [2]

**12** A printer runs out of ink and needs a new ink cartridge. An interrupt is sent and a message is generated to notify the user that the ink cartridge is empty.

**(a)** Complete the paragraph about the use of an interrupt in this process.

Use the terms from the list.

Some of the terms in the list will **not** be used. You should only use a term once.

binary clock computer data error

fetch–decode–execute cycle hexadecimal higher interrupt queue

interrupt service routine (ISR) lower printer priority level

secondary storage sorting transmission

The ..... sends an interrupt to the

..... . The interrupt is given a

..... . The processor completes its current

..... and checks the

..... to see if there is an interrupt with

..... priority than the current task. If there is, it stores the current task and fetches the interrupt. It then calls the

..... , which is a sequence of instructions that handles the interrupt. The interrupt is handled, which generates a message to the user to notify them that the ink cartridge is empty.

[7]

**(b)** Handling interrupts is one function of an operating system.

Give **two** functions of an operating system that relate to memory.

1 .....

2 .....

[2]

**13** A computer has an operating system.

**(a)** The operating system provides several functions.

**(i)** Tick (✓) **one** box to show which of these is **not** a function of the operating system.

| | | |
|---|---|---|
| **A** | managing files | ☐ |
| **B** | providing an interface | ☐ |
| **C** | handling interrupts | ☐ |
| **D** | loading the bootstrap | ☐ |

[1]

**(ii)** Identify **one** other function of an operating system.

Describe the purpose of this function.

.....

.....

.....

..... [2]

**(b)** Give the name of the set of instructions that are provided to the operating system to allow it to run.

..... [1]

**14** Different types of software can be run on a computer.

**(a)** State what is meant by software.

.....

..... [1]

**(b)** Utility software is one type of software that can be run on a computer.

Tick (✓) **one** box to show which software is an example of utility software.

**A** spreadsheet ☐

**B** anti-virus ☐

**C** web browser ☐

**D** database ☐

[1]

**(c)** Identify the type of software that manages inputs and outputs for the computer.

..... [1]