

1. The performance of a computer system can be improved by adding more RAM.

Explain why adding more RAM will improve the performance of a computer system.

-----[3]

2(a). An embedded system is often a small device that is designed to carry out a limited number of specialised tasks. Professional athletes sometimes wear small embedded systems called fitness trackers in their shirts. These can be used to track their speed, position, heart rate and other performance data during an event. The tracker transmits this data to a pitch-side server which collates the data from all the athletes.

State the name of **one** input device that might be used in this embedded system and state what it would be used for.

Device

Use

-----[2]

(b). The fitness tracker manufacturers had to decide which type of secondary storage to use.

Explain **two** reasons why flash (solid state) storage would be the best type of secondary storage for the fitness tracker system.

1

2

-----[4]

(c). One use of ROM is to store the Basic Input Output System (BIOS). The BIOS is used when the computer is first turned on.

- i. Describe what the BIOS will do to start up the computer.

----- **[3]**

- ii. Apart from storing the BIOS, ROM can also be used in other ways.

Describe how an embedded system can make a different use of ROM and why it is an advantage.

----- **[2]**

3(a). State the role of RAM in a computer system.

----- **[1]**

(b). Amaya is an amateur photographer and has bought an old second-hand computer to edit her photographs. The specifications of this computer are shown below.

Processor: Dual Core 1.8 GHz
RAM: 1 GB
HDD: 500 GB

Explain what is meant by the term ‘virtual memory’ and why this may be needed when Amaya is editing her photographs.

----- **[2]**

4. A team of programmers create a robot that will be used in a factory. The robot will be able to do the work of multiple humans.

The programmers discuss whether to write the instructions for the robot in assembly language or a high-level language.

The robot uses a multi-core processor. The programmers assume that this means that the robot will execute programs more quickly than using a single core processor.

- i. Give **one** reason why this assumption can sometimes be true.

[1]

- ii. Explain why this assumption is not always true.

[2]

5(a). OCRSystems are designing a new CPU for a computer system that will be used for video rendering. Part of the video rendering process is when the video is exported. This is when the computer combines all of the separate video elements together to form the final video.

An important design consideration is whether OCRSystems use a CISC processor type or a RISC processor type.

Describe **one** difference between a CISC processor and a RISC processor.

[2]

(b). OCRSystems are considering using parallel processing in a computer system that will be used for video rendering.

Describe how parallel processing would increase the performance of this computer system.

[3]

(c). A computer system will contain several input and output devices.

Explain the role of device drivers when using input and output devices on a computer system.

[2]

(d). Before a video is rendered, the user will first capture and edit the individual video elements before they are combined together to form the final video.

i. State **two** different output devices that could be used when editing the videos.

1

2

[2]

ii. A storage device is used to store the individual video elements while they are being captured in different locations and during the video editing process.

Discuss the suitability of a flash storage device **and** a magnetic storage device for storing the different video elements while they are being collected and edited.

You should refer to the following in your answer:

- the benefits of each type of storage
- the drawbacks of each type of storage
- the suitability of each type of storage.

[9]

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For each of these, discuss whether magnetic storage or solid state storage would be most suitable, taking into account the advantages and disadvantages of both.

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8. CPUs can be designed to take a Complex Instruction Set Computer (CISC) or a Reduced Instruction Set Computer (RISC) approach.

Describe **one** difference between CISC and RISC.

[2]

9. Imogen buys a desktop computer. It comes with an operating system installed.

i. Describe **two** ways that an operating system could manage physical memory.

1

[4]

ii. Explain **one** benefit of memory management to the user.

[2]

iii. Describe how virtual memory allows a user to run programs when physical memory is full.

[2]

END OF QUESTION PAPER