



4.7.1 Internal Hardware Components

- 1) A particular computer system uses a 32-bit address bus and a 32-bit data bus. Each addressed memory location can store one byte of data.

a) What is the maximum amount of memory, in bytes, that could be accessed?

[1 mark]

b) A different computer system has a wider data bus; this will speed up the execution of programs.

Explain how the wider data bus has resulted in this effect.

[1 mark]

- 2) Explain what a register is.

[1 mark]

- 3) The control unit is an important component of a processor.

Describe the role of the control unit.

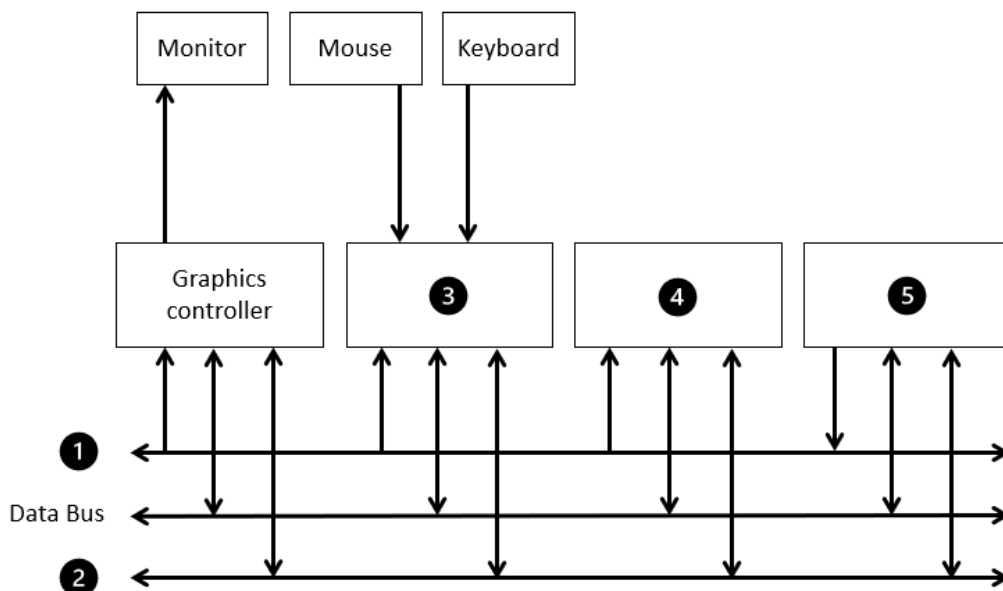
[3 marks]





- 4) **Figure 1** shows how some of the components inside a computer are connected. The computer uses the von Neumann architecture. Some of the names of components have been omitted from **Figure 1**.

Figure 1



Complete the table below by entering numbers that correspond with the components from **Figure 1**.

Component Name	Component Number (1-5)
Address Bus	
Control Bus	
Main Memory	
Processor	
USB I/O Controller	

[2 marks]





- 5) A tablet computer uses the Harvard architecture. Describe **two** advantages of using the Harvard architecture compared to the von Neumann architecture.

[2 marks]

- 6) Which of the statement below about a computer that uses the stored program concept is **false**.

A	Instructions are fetched and executed in sequence.
B	The computer can only be used with one program.
C	The data is stored in the main memory.
D	The program is stored in the main memory

[1 mark]

- 7) A USB interface inside a computer is an example of an I/O controller.

- a) Describe the role of an I/O controller.

[2 marks]

- b) The computer's address bus uses 36 wires and each main memory location can hold a 16-bit value.

In gibibytes, express the maximum amount of main memory that could be installed in the computer, assuming the CPU could access all the memory using the address bus.

You should show your working.

[2 marks]

- c) State an example of how the control bus is used when the processor stores data into main memory.

[1 mark]

