

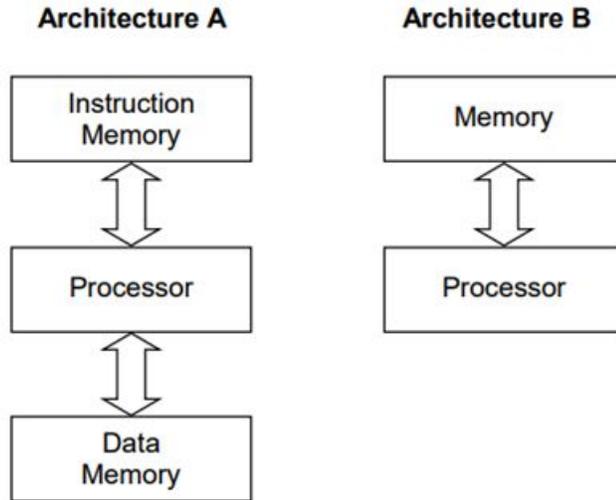
AQA Computer Science A-Level
**4.7.1 Internal hardware components of a
computer**
Past Paper Questions

Additional Specimen Paper 2

0 4

Figure 1 shows two alternative architectures for computer systems.

Figure 1



0 4 . 1

Identify which of **Architecture A** or **Architecture B** is the Harvard architecture by shading in **one** lozenge below.

[1 mark]

Harvard architecture is: **Architecture A** **Architecture B**

0 4 . 2

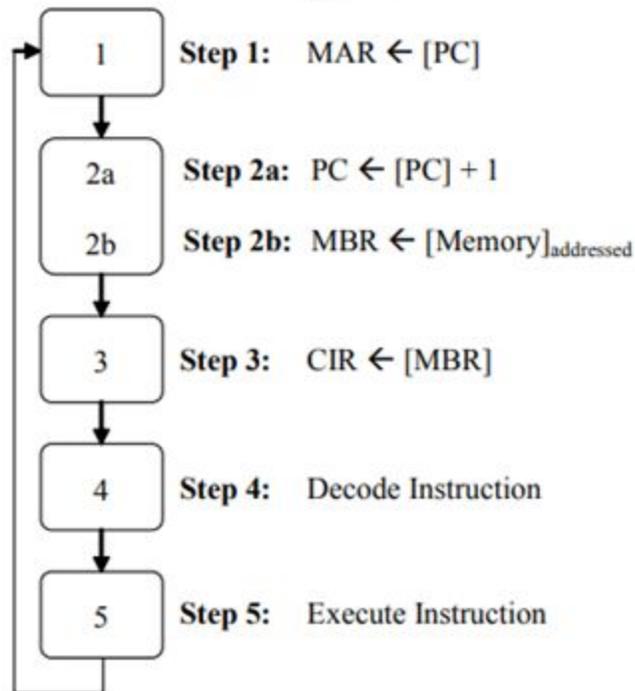
Describe **one** situation that the Harvard architecture is used for, and explain what advantages the Harvard architecture has over the von Neumann architecture.

[3 marks]

January 2010 Comp 2

3 **Figure 1** shows the fetch-execute cycle. Steps 2a and 2b occur at the same time.

Figure 1



- 3 (a) State the full names of **two** of the special purpose registers that are used in the fetch part of the fetch-execute cycle.

Register 1:

Register 2:

(2 marks)

- 3 (b) Explain the role of the address bus, data bus and main memory during Steps 1 and 2b.

.....
.....
.....
.....
.....

(2 marks)

- 3 (c) Give **one** reason why Steps 2a and 2b are able to occur at the same time.

.....
.....

(1 mark)

January 2011 Comp 2

- 1 The internal components of a computer system are connected together by three buses.

- 1 (a) State the name of the only unidirectional bus.

.....
(1 mark)

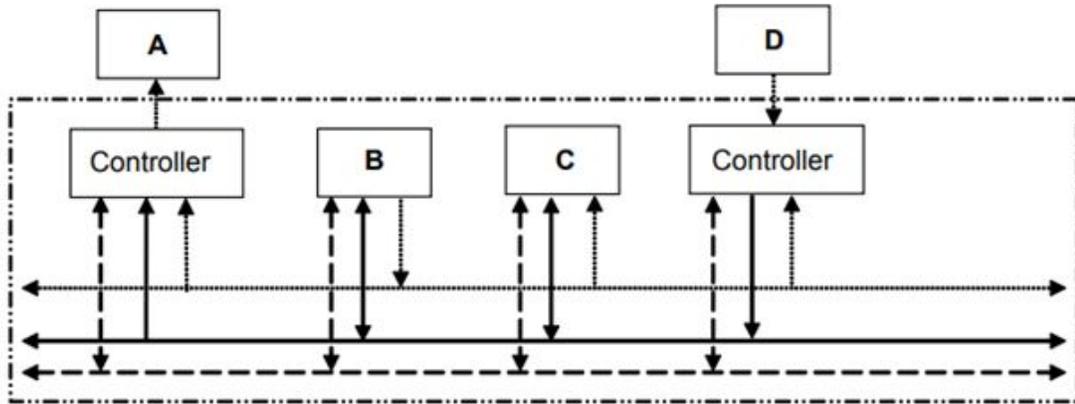
- 1 (b) If a computer has a 32-bit address bus, of 32 lines, it can access **4 gigabytes** of main memory for all forms of internal use.

How many additional lines does the address bus need for it to be capable of addressing up to **8 gigabytes** of main memory? Write your answer in the box below.

(1 mark)

- 1 (c) Figure 1 shows how components of a computer system can be connected.

Figure 1



Write, in the corresponding space below, the correct name for each of **A**, **B**, **C** and **D** from **Figure 1** using only the following:

Processor, Address Bus, Data Bus, Main Memory, Keyboard and Visual Display Unit

- A**
- B**
- C**
- D**

(4 marks)

January 2013 Comp 2

- 2 The data bus, control bus and address bus are three important parts of a modern computer.

- 2 (a) In this context, explain what is meant by the term *bus*.

.....

.....

.....

(2 marks)

2 (b) Fill in the gaps in the paragraph below.

The data bus can be used to transfer data and between the main memory and the processor. The control bus carries control signals. An example of a control signal is

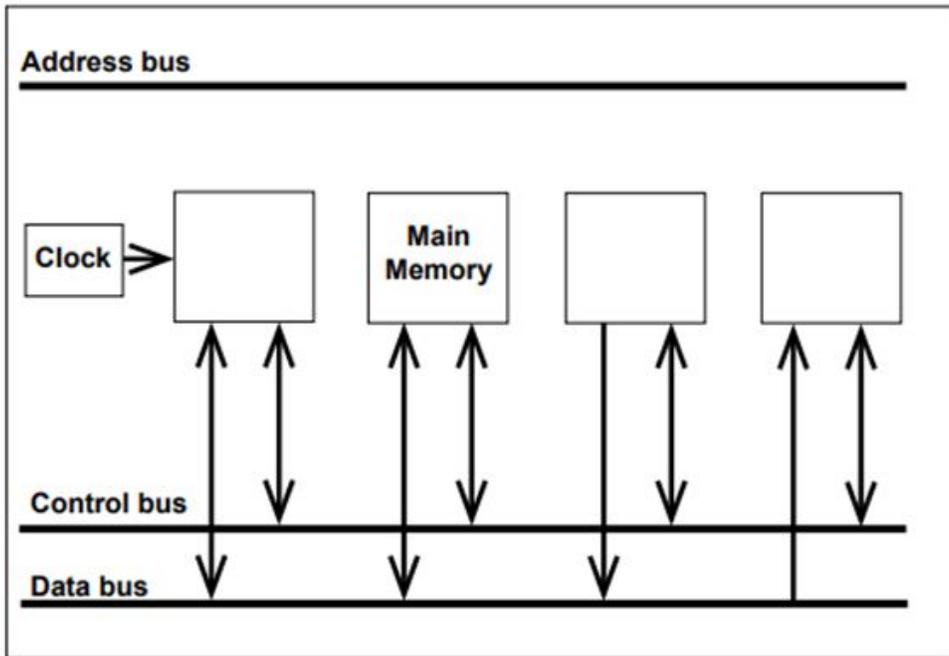
.....

.....

(2 marks)

2 (c) Figure 1 shows some of the internal components of a computer system.

Figure 1



On Figure 1 label the following components.

Processor, Keyboard controller, Graphics controller

Draw **all** the connections between the address bus and the components. Make sure that you **clearly** show the direction of each connection.

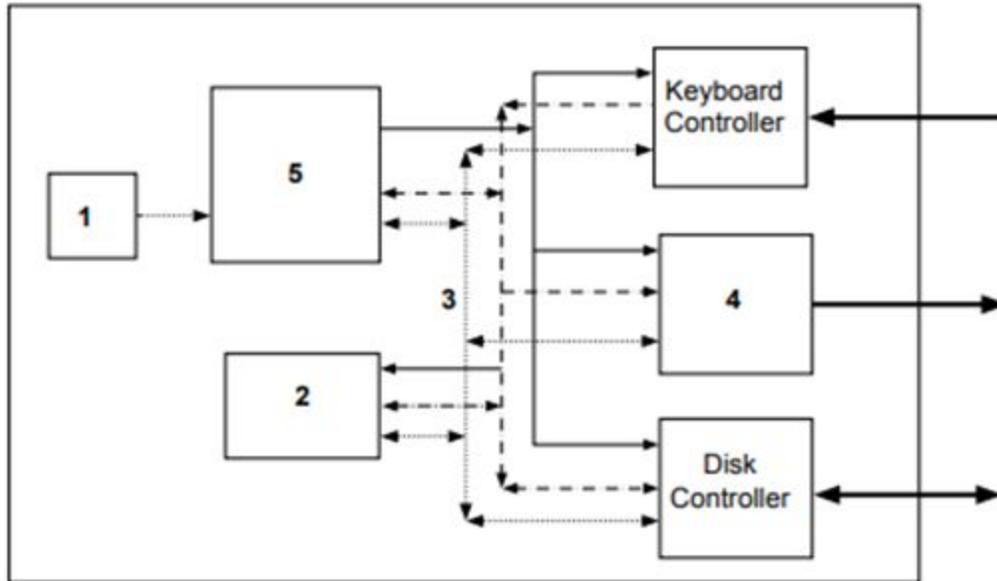
(5 marks)

June 2011 Comp 2

7

Figure 5 shows some of the components of a computer system.

Figure 5



- 7 (a) Suggest names for the components numbered 1 to 5 in Figure 5 by completing the table below.

Number	Component Name
1	
2	
3	
4	
5	

(5 marks)

7 (d) Modern computers often have a *64-bit address bus*.

Explain what this means.

.....
.....

(1 mark)

June 2017 AS Paper 2

0 6

The two most common computer architectures are **Harvard** and **von Neumann**.

0 6 . 1

Describe **one** difference between the way the Harvard and von Neumann architectures operate.

[2 marks]

.....
.....
.....
.....
.....
.....

0 6 . 2

Shade **one** lozenge to indicate the type of computer architecture that is typically used for digital signal processing.

[1 mark]

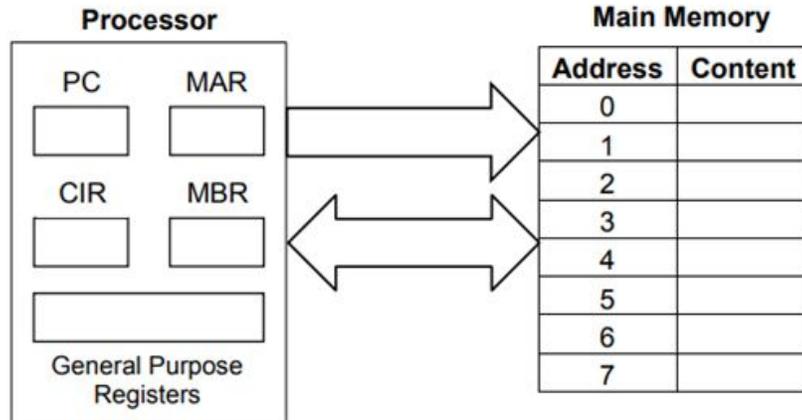
Harvard	<input type="radio"/>	von Neumann	<input type="radio"/>
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June 2017 Paper 2

0 1

Figure 1 shows some of the internal components of a processor and how the processor is connected to the main memory. The internal connections within the processor are not shown.

Figure 1



The computer system shown in **Figure 1** uses the von Neumann architecture. The Harvard architecture is an alternative to this.

0 1 . 3

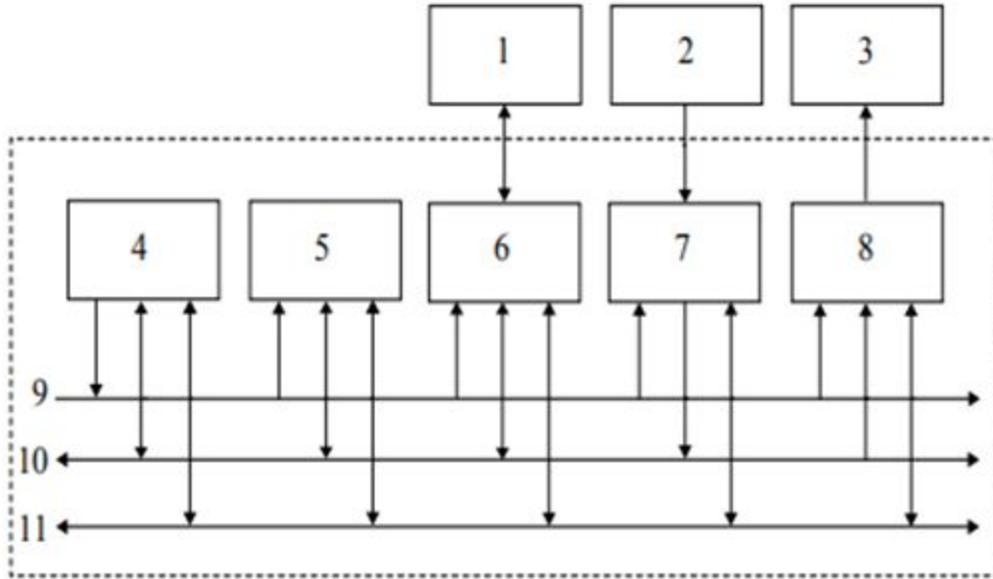
Explain why the Harvard architecture is sometimes used in preference to the von Neumann architecture.

[2 marks]

June 2009 Comp 2

6 **Figure 4** is a diagram of some of the components of a computer system.

Figure 4



Match the component names to the numbers shown in **Figure 4** by completing the tables below. Some of the numbers have already been written in for you.

Internal Components	
Data Bus	
Address Bus	
Control Bus	11
VDU Controller	
Disk Controller	6
Keyboard Controller	
Main Memory	
Processor	

External Components	
Keyboard	
Visual Display Unit	
Secondary Storage	1

(6 marks)

Specimen Paper 2

0 1

Figure 1 shows how some of the components of a computer system can be connected together.

Figure 1

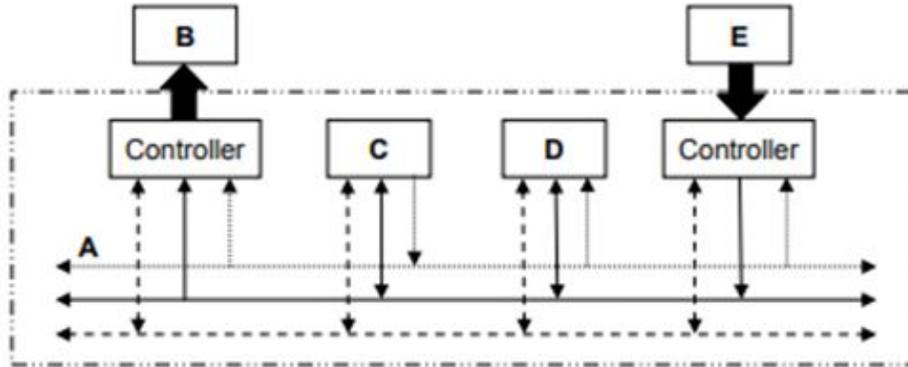


Table 1 lists the names of six components in the column headings and the five letters (A-E) from **Figure 1** in the row headings.

For each row in **Table 1**, shade **one** lozenge, in the appropriate column, to indicate which component in **Figure 1** has been labelled with the row letter.

As an example, the first row has been completed for you, to indicate that component **A** in **Figure 1** is the Address bus.

[4 marks]

Table 1

	Processor	Address bus	Data bus	Main memory	Keyboard	Visual display unit
A	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>