



MAY/JUNE 2015

Q 1 One of the key features of von Neumann computer architecture is the use of buses.

Three buses and three descriptions are shown below.

Draw a line to connect each bus to its correct description.

Bus		Description
address bus		this bus carries signals used to coordinate the computer's activities
control bus		this bi-directional bus is used to exchange data between processor, memory and input/output devices
data bus		this uni-directional bus carries signals relating to memory addresses between processor and memory

[2]

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Q 2 The seven stages in a von Neumann fetch-execute cycle are shown in the table below.

Put each stage in the correct sequence by writing the numbers 1 to 7 in the right hand column.
 The first one has been done for you.

Stage	Sequence number
the instruction is then copied from the memory location contained in the MAR (memory address register) and is placed in the MDR (memory data register)	
the instruction is finally decoded and is then executed	
the PC (program counter) contains the address of the next instruction to be fetched	1
the entire instruction is then copied from the MDR (memory data register) and placed in the CIR (current instruction register)	
the address contained in the PC (program counter) is copied to the MAR (memory address register) via the address bus	
the address part of the instruction, if any, is placed in the MAR (memory address register)	
the value in the PC (program counter) is then incremented so that it points to the next instruction to be fetched	

[6]

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Q 3 State **four** functions of an operating system.

- 1
- 2
- 3
- 4



[4]

Q 4 Four computer terms and **eight** descriptions are shown below.

Draw lines to connect each computer term to the correct description(s).

Computer term	Description
Arithmetic and logic unit (ALU)	Data can be read but not altered
Control unit	Carries out operations such as addition and multiplication
Random access memory (RAM)	Stores bootstrap loader and BIOS
Read only memory (ROM)	Fetches each instruction in turn
	Carries out operations such as AND, OR, NOT
	Stores part of the operating system currently in use
	Stores data currently in use
	Manages execution of each instruction



[4]

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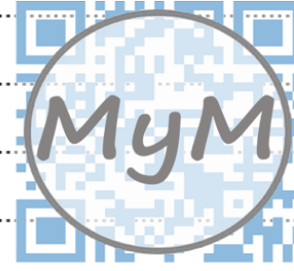
Q 5 Signals are sent to and from the components of a processor using buses.

Identify and describe the purpose of **two** different buses.

Bus 1

Purpose

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



Bus 2

Purpose

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

[6]

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Q 6 Name **three** different buses that are used in the fetch-execute cycle.

Bus 1

Bus 2

Bus 3



[3]

Q 7 State **three** functions provided by an operating system.

Function 1

.....

.....

Function 2

.....

.....



Function 3

.....

.....

[3]