JetLearn's GCSE (9–1) Computer Science -
Hardware
Time allowed: 1 hour

INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer all the questions.

INFORMATION

- The total marks for this paper is 50 marks.
- The marks for each question are shown in brackets [ ].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has 10 pages.

ADVICE

- Read each question carefully before you start your answer.

Attempt all questions

1. Ann wants to purchase a new computer and is looking at two models. The specification of the CPU in each computer is shown in **Fig. 1.**

Fig.1

Computer 1	Computer 2
Clock Speed: 1 GHz	Clock Speed: 1.4 GHz
Cache size: 2 MB	Cache size: 2 MB
Number of Cores: 4	Number of Cores: 2

a) When running a 3D flight simulator, Computer 1 is likely to run faster than Computer 2.

Using the information in Fig. 1, identify one reason for this.

.....

.....[1]

b) Identify two other parts of a computer that are not in Fig. 1, which could improve the performance of the computers.

1.....

2.....[2]

c) Explain **one** reason why the cache size affects the performance of the CPU.

.....

.....[1]

d) Identify two events that take place during the fetch-execute cycle.

1.....

.....

2.....

.....[2]

2. Kerry wants to buy a new computer, but she does not understand what the different parts of a computer do.Kerry has heard of a CPU but does not know what it is.

a) The following sentences describe the purpose of a CPU. Complete the sentences by filling in the missing words.

CPU stands for ..... It is the part of the computer that fetches and executes the ..... that are stored in ..... .

The CPU contains the Arithmetic ..... Unit (ALU) and the ..... Unit (CU). [5]

b) Kerry is looking at two computers; one has a single core processor and the other has a dual core processor. Explain why having a dual core processor might improve the performance of the computer.

.....

.....[2]

3. Julie's computer is used for word processing documents with lots of images, managing spreadsheets and playing music all at the same time. Julie's computer frequently needs to make use of virtual memory.

a) Describe virtual memory and explain how it works.

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.....[2]

b) Explain how Julie can improve the performance of her computer.

.....

.....

.....

.....[2]

4. A satellite navigation system (Sat Nav) uses RAM and ROM.

a) Tick **(✓)** one box in each row to show whether each of the statements is true for the RAM or ROM in a Sat Nav

	RAM	ROM
Stores the boot up sequence of the Sat Nav.		
The contents are lost when the Sat Nav is turned off.		
Holds copies of open maps and routes.		

[3]

b) The Sat Nav contains an embedded system. Define what is meant by an 'embedded system'.

.....

.....[2]

c) Identify three devices, other than a Sat Nav, which contain embedded systems.

1.....

2.....

3.....[3]

5. Vicky has been on holiday and has taken lots of photos. The memory in her camera is

now full and she needs to transfer her photos to an external secondary storage device.

a) Define what is meant by 'secondary storage'.

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.....[1]

b) Identify the three common storage technologies Vicky can choose from.

1.....

2.....

3.....[3]

c) State four characteristics of secondary storage devices that Vicky should consider when choosing a device.

1.....

2.....

3.....

4.....[4]

6. A small business backs up the data on its computer system every day. Compare backing up the data to a magnetic hard disc with backing up to an optical disc.

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.....[3]

7. The table has five components of a computer, and four statements. Tick (✓) one or more boxes in each row to identify which component(s) each statement describes.

Statement	MAR	MDR	Cache	Program Counter	RAM
It stores a single address					
It stores frequently used instructions					
It is a register					
It stores all currently running data **and** instructions					

[4]

8. The following paragraph describes embedded systems.

Complete the paragraph by selecting terms from the list and writing them in the correct places. Not all terms are used.

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Actuator        applications          change
functions         laptop          larger       lights
microprocessor                  processor                  range
smaller
washing machine
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Embedded systems have limited ..... They are often built into a ..... machine. Two examples of embedded systems are a ..... and automated ..... in a car. [4]

9. The table below shows a segment of primary memory from a Von Neumann model computer

Address	Contents
10001	11001101
10010	11110001
10011	10101111
10100	10000110
10101	00011001
10110	10101100

The program counter contains the data 10010.

a)State the data that will be placed in the memory address register (MAR).

.....[1]

b)State the data that will be placed in the memory data register (MDR).

.....[1]

10) Dipesh is thinking of buying a tablet computer to replace his old desktop computer.

a) Describe how the CPU and RAM work together to enable the tablet computer

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.....[3].

b) The tablet computer also uses cache memory. Describe the purpose of cache memory

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.....

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.....[2].

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

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