

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]
[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
the



	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.
	[2]
	b) Explain how Julie can improve the performance of her computer.
	[2]



	4.	A satellite	navigation	svstem	(Sat Nav)	uses RAM	and ROI
--	----	-------------	------------	--------	-----------	----------	---------

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]

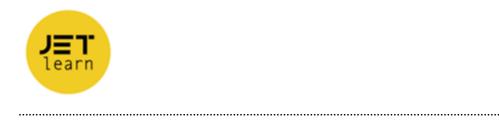
b) ⁻	The	Sat	Nav	cor	ntains	an	emb	edded	sys	tem.	Define	what	is	meant	by	an
	'em	bedo	ded s	ystei	m'.											
••••	• • • • • • • •	•••••	•••••		•••••	••••••	•••••	••••••	• • • • • • • • • • • • • • • • • • • •	•••••	••••••	•••••	•••••	•••••	•••••	۰۱۲
c) l	dent	ify tl	ree (devid	ces, o	ther	than	a Sat I	Vav, v	which	n contai	n emb	edd	led sys	tems	s.
1		•••••														
2																
2																ro1

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'.	
	[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	
4	
A small business backs up the data on its computer system every day. Co	mpar
king up the data to a magnetic hard disc with backing up to an optical disc.	•



7. The table has five components of a computer, and four statements. Tick (\checkmark) 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.

Actuator applications change
functions laptop larger lights
microprocessor processor range
smaller
washing machine

Embedded systems have limited Th	ney are often built into
a machine. Two examples of en	mbedded 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
เรา



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

