Name:

Class Teacher:

Date:

OCR J276

GCSE Computer Science

REVISION BOOKLET – MARK SCHEME

1.2 MEMORY

Content in J276 GCSE Computer Science:

1.1 Systems Architecture

1.2 Memory

1.3 Storage

1.4 Wireless and Wired Networks

1.5 Network Topologies, Protocols and Layers

1.6 System Security

1.7 Systems Software

1.8 Ethical, Legal, Cultural and Environmental Concerns

2.1 Algorithms

2.2 Programming Techniques

2.3 Producing Robust Programs

2.4 Computational Logic

2.5 Translators and Facilities of Languages

2.6 Data Representation

EXAM QUESTIONS

QUESTION 1

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

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

Identify **two** internal components that are now shown above, which could improve the performance of the computers.

1			RAM SSD HDD Graphics card (GPU)	2	Marks can be awarded for other appropriate responses: E.g. Motherboard Sound card	

QUESTION 2

Gareth has a satellite navigation system (Sat Nav) in his car that uses RAM and ROM. Below are listed some characteristics of computer memory. Tick **one** box in each row to show whether each of the statements is **true** for the RAM or ROM in Gareth's Sat Nav.

				RAM	ROM			
2			Stores the boot up sequence of the Sat Nav.		✓	3	Award 1 mark for each correct tick. No marks should be awarded if ticks are in both boxes in a given row.	
			The contents are lost when the Sat Nav is turned off.	✓				
			Holds copies of open maps and routes.	✓				

QUESTION 3

Bob's computer has 512 kilobytes of ROM and 8 gigabytes of RAM. Describe the purpose of the ROM in Bob's computer.

3	a	i	ROM • Stores the boot program / bootstrap loader / BIOS • Used to start the computer / Loads the operating system.	4	**?Examiner's Comments??** Many candidates demonstrated a good knowledge of facts about the RAM and ROM, but some of these failed to score well by being less discerning about the facts that are relevant to answering the question. This part asked for the purpose of ROM and RAM, but several candidates listed the characteristics.	

Describe the purpose of the RAM in Bob's computer.

			RAM			
		ii	• Stores the parts of the OS / programs that are running… • Stores the data currently in use • … for access by the CPU *(2 for each)*			

State **one** difference between ROM and RAM, other than the size and the purpose.

			eg			
	b		• ROM is non-volatile and RAM is volatile • RAM is easily expandable, ROM size is (usually) fixed for a given computer • Contents of RAM change frequently, contents of ROM never (hardly ever) change.	1	**?Examiner's Comments** Many candidates demonstrated a good knowledge of facts about the RAM and ROM, but some of these failed to score well by being less discerning about the facts that are relevant to answering the question. In this part where candidates needed to give one difference between RAM and ROM, candidates fared better.	

QUESTION 4

A computer has 1024 megabytes of RAM. State **two** items that will be stored in the RAM.

4	a		• Operating system • Other programs that are running / in current use • Data in current use	2	Accept examples for the second and third bullet points as long as it is clear that the programs / data are currently in use Accept instructions for programs **Examiner's Comments** The most common error made by candidates was that they did not specify that programs and data/files are in RAM *while they are in use*.	

A computer sometimes uses virtual memory. Describe what is meant by virtual memory and state why it is needed.

	b		- Using the hard disk / secondary storage - Used as RAM / to store the contents of RAM / main memory - Needed when there isn't enough physical memory	3	Note that these points may be worded differently. E.g. "items are taken from memory and stored on the hard disk until needed" achieves the first two bullet points. **Examiner's Comments** Where candidates had explicitly studied the use of virtual memory, they were able to give a detailed description to gain 2 or 3 marks in this part. A number of candidates appeared to be guessing the answer, the most common wrong answers confusing virtual memory with cloud storage.	

QUESTION 5

Dipesh is thinking of buying a tablet computer to replace his old desktop computer. Describe how the CPU and RAM work together to enable the tablet computer to operate.

5	a		- Instructions / programs(currently running) / data are stored in the RAM… - these are fetched from the RAM by the CPU / Processor … where the instructions are executed / instructions are processed / data is processed	3	If the candidate has described the functions of RAM and the CPU separately, only award the 2nd bullet if it is clearly stated that instructions are fetched from RAM. Mention of the fetch – execute cycle in the CPU is enough to award bullet 3.	

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

	b		- To store instructions / data that is frequently used / previously used / next to be used - Data does not need to be fetched from RAM - Speeds up access	2		

Describe how the advances in memory technology have allowed significant improvement in the performance of devices such as tablet computers. The quality of your written communication will be assessed in your answer.

	c		E.g. Memory; • Smaller in size • Faster access • Larger capacity • More durable • Costs less per byte / kb etc Technology can; • be smaller • be more mobile / portable • have similar capacity	6		**Higher Level Response (5–6)** Candidates will describe the advances in memory and how these have impacted computers. Points made about the memory are detailed and linked to the advances There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly. **Medium level Response (3–4)** Candidates will describe some advances in memory and improvements in performance. Points made about the memory lack detail or may not be linked to the advances. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct. **Low level Response (0–2)** Candidates may identify changes in technology or changes in memory. Information will be poorly expressed and there will be a limited, if any, use of technical terms. Errors of grammar, punctuation and spelling may be intrusive.