

Name:

Class Teacher:

Date:



OCR J276

GCSE Computer Science

REVISION BOOKLET – MARK SCHEME

1.3 STORAGE

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

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. Define what is meant by 'secondary storage'.

2	a		<ul style="list-style-type: none"> • Long term/non-volatile storage of data/files • External/auxiliary storage of data 	1	1 mark only to be awarded for a correct definition.	
---	---	--	--	---	---	--

Identify **three** common storage technologies Vicky can choose from.

	b		<ul style="list-style-type: none"> • Optical • Magnetic • Solid state 	3	1 mark only to be awarded for each correct definition.	
--	---	--	--	---	--	--

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

	c		<p>Four characteristics from:</p> <ul style="list-style-type: none"> • Capacity/size • Speed • Portability • Durability • Reliability • Cost 	4	1 mark is to be awarded for each correct characteristic to a maximum of 4 marks.	
--	---	--	--	---	--	--

QUESTION 3

Most computer systems use at least one storage device. Explain **one** reason why a secondary storage device is needed in most computer systems.

3	a		<ul style="list-style-type: none"> • To store the files / e.g. operating system • Even when the system is switched off / which must be non-volatile. 	2	<p>Examiner's Comments</p> <p>It was evident that a majority of the candidates did not understand the term "secondary storage" and we suspect that they guessed (rather than had been taught) that this was some kind of backup storage medium in case the hard drive failed, which is the answer that most gave.</p>	
---	---	--	--	---	--	--

Some secondary storage devices are magnetic and others are solid state. Describe the characteristics of magnetic and solid state secondary storage. The quality of written communication will be assessed in your answer to this question.

	b		<p><i>Points may include:</i></p> <p>Magnetic:</p> <ul style="list-style-type: none"> • Tend to be large capacity, relatively cheap • Sensitive to movement of system due to moving parts • Used as main storage for computers, e.g. to store OS. <p>Solid state</p>	6	<p>Examples may have been used to clarify points but are not required for the levels.</p>	<p>High Level Response (5–6 marks)</p> <p>A detailed description of characteristics of both solid state and magnetic devices. Examples, if used, will be appropriate. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p> <p>Medium Level Response (3–4 marks)</p> <p>A limited description of characteristic(s) of a solid state and / or magnetic devices. Examples, if used, are weak and do not follow from the points being made. There</p>
--	---	--	---	---	---	--

- Relatively expensive so tend to be of smaller capacity
- No moving parts so not sensitive to movement
- Used when portability is important... transferring files, USB keys... or as main storage for PDAs, mobile computers
- ... as a result, portable magnetic formats (e.g. floppy disks) are no longer used in favour of solid state storage.

may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.

Low level Response (1–2 marks)

An attempt to describe the characteristic(s) of magnetic or storage. 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.

No response or response not worthy of credit (0 marks)

Examiner's Comments

Some candidates did not read the question carefully. It asked for the characteristics of magnetic and solid state storage, but these candidates wrote about the applications of these types of storage and how they work (sometimes in great detail). There was some evidence of candidates making "uninformed guesses" here such as making a semantic association between the "hard" in hard drive and the "solid" in solid state, and assuming that hard drives and solid state storage mean the same thing. That said, it was encouraging to note the currency of the knowledge of some candidates who included solid-state as well as magnetic hard drives in their response. On the other hand, examiners were surprised by the number of candidates who thought of magnetic storage exclusively in terms of magnetic tape and floppy disks and ignored the most current use of this technology.

QUESTION 4

Apu has a handheld e-book reader that allows him to store and read electronic books. Types of secondary storage devices are magnetic, optical or solid state. State which type of storage is most suitable for storing the electronic books inside the e-book reader.

4	a	i	<ul style="list-style-type: none"> • Solid state 	1		
---	---	---	---	---	--	--

Explain **one** reason why this type of storage is the most suitable.

		ii	<ul style="list-style-type: none"> • Fast access... • ... less delays when turning the device on / turning pages etc... • No moveable parts / robust • ... can be handled / manipulated / moved without damaging it • Small / light enough... • ... to fit within a hand held device • low power • ... to extend battery life of reader 	2	<p>No follow through from (i). Candidates need to identify a relevant characteristic of solid state storage for the first mark, and expand by explaining why this is an advantage in an e-book reader for the second mark.</p> <p>Note that portable / capacity are not acceptable answers here (as solid state storage is not particularly more portable / larger than other forms of storage for this application)</p> <p>Examiner's Comments</p> <p>??In this part, most candidates demonstrated an awareness of the key characteristics of different types of secondary storage. The strongest candidates were able to clearly link the characteristics of solid state storage to the operational requirements of an e-book reader. Centres should encourage candidates to answer such questions positively, for example, by arguing why the characteristics of solid state storage make it most suitable, rather than why magnetic and optical storage are not suitable.</p>	
--	--	----	---	---	--	--

Apu gets a free e-book on a CD-ROM from a magazine. Give **two** reasons why a CD-ROM is suitable in this case.

	b	i	<p>e.g.</p> <ul style="list-style-type: none"> • Cheap to produce • Easily portable / Fits in a magazine • Enough capacity for e-books • Can be read by other devices e.g. computers • Read only / can't write over 	2	<p>Note that portable / capacity are acceptable answers here (as they are relevant characteristics of a CD ROM)</p> <p>Do not accept "compact" (unless portability is clearly implied)</p> <p>Examiner's Comments</p> <p>In this part, most candidates demonstrated an awareness of the key characteristics of different types of secondary storage. The strongest candidates were able to clearly link the characteristics of solid state storage to the operational requirements of an e-book reader. Centres should encourage candidates to answer such questions positively, for example, by arguing why the characteristics of solid state storage make it most suitable, rather than why magnetic and optical storage are not suitable.</p>	
--	---	---	--	---	--	--

State whether a CD-ROM is magnetic, optical or solid state storage.

		ii	<ul style="list-style-type: none"> • optical 	1		
--	--	----	---	---	--	--

QUESTION 5

A computer has 1024 megabytes of RAM. How many gigabytes of RAM does the computer have?

5			<ul style="list-style-type: none"> • 1GB 	1	<p>Accept 1.024</p> <p>The units are not necessary</p> <p>Examiner's Comments</p> <p>Was generally well answered.</p>	
---	--	--	---	---	--	--