

Spring 1 Walking Talking Mock Computer Science

OCR ExamBuilder process constraints mean you may see slight differences between this paper and the original.

Candidates answer on the Question Paper.
A calculator may be used in this paper.

OCR supplied materials:

Additional resources may be supplied with this paper.

Other materials required:

- Pencil
- Ruler (cm/mm)

Duration: 45 mins

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Where space is provided below the question, please write your answer there.
- You may use additional paper, or a specific Answer sheet if one is provided, but you must clearly show your candidate number, centre number and question number(s).

INFORMATION FOR CANDIDATES

- The quality of written communication is assessed in questions marked with a pencil or an asterisk.
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **51**.

Answer **all** the questions.

1. Zoe is organising a LAN-party. Her friends will each bring a computer to the party so that they can play games against each other.

Describe what is meant by a Local Area Network (LAN).

[2]

2. A company, OCR Supermarkets, has supermarket stores throughout the country. The computers for each store connect to the central office using a Wide Area Network (WAN).

Identify **two** differences between a WAN and a LAN (Local Area Network).

Difference 1: -----

Difference 2: -----

[2]

3(a). A computer has 1024 megabytes of RAM.

State **two** items that will be stored in the RAM.

1

2

[2]

(b). The computer sometimes uses virtual memory.

Describe what is meant by virtual memory **and** state why it is needed.

[3]

4(a). 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.

- (i) State which type of storage is most suitable for storing the electronic books inside the e-book reader.

----- [1]

- (ii) Explain **one** reason why this type of storage is the most suitable.

----- [2]

(b). Apu gets a free e-book on a CD-ROM from a magazine.

- (i) Give **two** reasons why a CD-ROM is suitable in this case.

1

2

----- [2]

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

----- [1]

(c). The manufacturer of the e-book reader provides proprietary software, which Apu can use to transfer the e-book from the CD-ROM to the e-book reader.

(i) Describe what is meant by proprietary software.

[2]

(ii) Explain **one** advantage to the manufacturer of providing proprietary software instead of open source software.

[2]

- 5(a). 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.

[3]

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

[2]

6. Here are some statements about the CPU of a computer.

Tick **one** box in each row to show whether each of the following statements is true or false.

Statement	True	False
CPU stands for Central Processing Unit.		
The CPU fetches and decodes instructions.		
The speed of a CPU is usually measured in GigaHertz (GHz).		
If a CPU has many cores, this slows down the computer.		
The hard disk drive is part of the CPU.		

[5]

7. A company, OCR Supermarkets, has supermarket stores throughout the country. The computers for each store connect to the central office using a Wide Area Network (WAN).

OCR Supermarkets use a client-server network to connect the checkout computers to the store's server.

Describe **two** benefits to OCR Supermarkets of using a client-server network instead of a peer-to-peer network.

Benefit 1: _____

Benefit 2: _____

[4]

8(a). Quinn is considering upgrading the RAM.

(i) Describe **two** differences between RAM and ROM.

Difference 1 -----

Difference 2 -----

[4]

(ii) Quinn has decided to upgrade the RAM on his computer. Explain why this would improve the computer's performance.

[2]

(iii) *After upgrading the RAM, Quinn could make further changes to improve his computer's performance.

Identify the changes and explain how these changes would improve performance.

The quality of your written communication will be assessed in your answer.

[6]

(b). Quinn's current computer specification is shown in Fig. 4.

1.5 GHz Dual Core Processor
1GB RAM
100GB Hard Drive
64KB Cache
Touchscreen
Integrated camera and speakers
2 × USB 3.0 ports
2 × USB 2.0 ports
Blu-ray drive
2GB Graphics Card

Fig. 4

Describe the benefits of a dual core processor over a single core processor.

[2]

9. A railway company uses a computer terminal in the train station to sell train tickets.



Customers input their destination using a touch screen, pay by card and receive a printed ticket and receipt.

Describe **two** ways that the hardware in the computer terminal can be adapted so that blind customers can use it.

1

2

[4]

END OF QUESTION PAPER

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
1			<ul style="list-style-type: none"> Computers are connected to each other Restricted to a small geographical area / site / other suitable example Dedicated wired or WiFi connections 	2	<p>For the first bullet point candidates should be describing a network – just the idea that computers are connected to "something" is not enough.</p> <p>For the third bullet point, just "connected by cables" is not enough as there is no indication these are dedicated cables for the network.</p> <p><u>Examiner's Comments</u></p> <p>Required candidates to describe what is meant by a Local Area Network, where one mark could be for describing each of the concepts "local area" and "network" in this context. Candidates who did not gain both marks often reused these terms in their answers instead of describing them.</p>
			Total	2	
2			<ul style="list-style-type: none"> WAN is over a large geographical area / needs to transmit over a large distance // a LAN is over a small geographical area. WAN uses external hardware / infrastructure / cables / network // LAN has its own infrastructure / cables / network / hardware due to distance / practicalities 	2	<p>NB Examples of infrastructure / hardware are allowed for WAN e.g. satellite, phone lines, Internet Allow LAN as Ethernet for second bullet</p> <p>NOT wide area for WAN</p> <p><u>Examiner's Comments</u></p> <p>Many candidates were able to correctly identify the difference in size between a WAN and a LAN. The better candidates also identified the difference in hardware, or ownership of the hardware used.</p>
			Total	2	

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
3	a		<ul style="list-style-type: none"> Operating system Other programs that are running / in current use Data in current use 	2	<p>Accept examples for the second and third bullet points as long as it is clear that the programs / data are currently in use</p> <p>Accept instructions for programs</p> <p>Examiner's Comments</p> <p>The most common error made by candidates was that they did not specify that programs and data/files are in RAM <i>while they are in use</i>.</p>
	b		<ul style="list-style-type: none"> 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	<p>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.</p> <p>Examiner's Comments</p> <p>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.</p>
			Total	5	

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
4	a	i	<ul style="list-style-type: none"> • Solid state 	1	
		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><u>Examiner's Comments</u></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>

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
	b	i	e.g. <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><u>Examiner's Comments</u></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>
		ii	<ul style="list-style-type: none"> • optical 	1	

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
	c	i	<ul style="list-style-type: none"> Source code not made available/ Only compiled code is published Licence restricts the copying / modifying / distribution of the software 	2	<p>The mention of a licence is not sufficient. Candidate should state that the licence restricts copying / modifying / distributing. "closed source" is not enough because it just gives an alternative term for "proprietary" without a description of what we mean by "closed"</p> <p><u>Examiner's reports</u></p> <p>This part was intended as a more difficult question to differentiate the top candidates, was generally poorly answered. It had been expected that more candidates would be able to provide a definition of proprietary software for part (i) but many candidates appeared unfamiliar with the term in the context in which it is used in the specification. For those who were aware of the term, several common misconceptions were repeated such as the idea that proprietary software is always sold at a cost.</p>

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
		ii	<p>eg</p> <ul style="list-style-type: none"> • Stops competing companies copying their software (or hardware / ebooks) • ... and producing similar / better products. • Ensures compatibility (with the e-book reader)... • ... as they can ensure that no modifications have been made <p>(mark points in pairs).</p>	2	<p>The first mark is for identifying a relevant advantage <i>to the manufacturer</i>, and the second for details expanding this point.</p> <p>Accept answers about preventing reverse engineering the company's product or piracy of the company's software or e-books (e.g. DRM) as referring to the first set of answers.</p> <p><u>Examiner's Comments</u></p> <p>This part was intended as a more difficult question to differentiate the top candidates and was generally poorly answered. Because of the general misunderstanding of the concept, and the necessity to apply it in this specific context and give advantages to the manufacture of the e-book reader in (ii), few candidates gained marks here. A common incorrect answer suggested that the manufacturer would benefit from selling the software to e-book users, when it was indicated in the question that the software is provided with the reader. Other incorrect answers appeared to be making points from a previous question about the use of open source software in schools, which did not apply in this context.</p>
			Total	10	

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance																		
5	a		<ul style="list-style-type: none">• 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	<p>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.</p> <p>Mention of the fetch – execute cycle in the CPU is enough to award bullet 3.</p>																		
	b		<ul style="list-style-type: none">• 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																			
			Total	5																			
6			<table><tr><th>Statement</th><th>True</th><th>False</th></tr><tr><td>CPU stands for Central Processing Unit</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr><tr><td>The CPU fetches and decodes instructions</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr><tr><td>The speed of a CPU is usually measured in GigaHertz (GHz)</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr><tr><td>If a CPU has many cores, this slows down the computer</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr><tr><td>The hard disk drive is part of the CPU</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr></table> <p><i>One mark per row</i></p>	Statement	True	False	CPU stands for Central Processing Unit	<input type="checkbox"/>	<input type="checkbox"/>	The CPU fetches and decodes instructions	<input type="checkbox"/>	<input type="checkbox"/>	The speed of a CPU is usually measured in GigaHertz (GHz)	<input type="checkbox"/>	<input type="checkbox"/>	If a CPU has many cores, this slows down the computer	<input type="checkbox"/>	<input type="checkbox"/>	The hard disk drive is part of the CPU	<input type="checkbox"/>	<input type="checkbox"/>	5	<p>☐Examiner's Comments☐</p> <p>This question was generally well answered.</p>
Statement	True	False																					
CPU stands for Central Processing Unit	<input type="checkbox"/>	<input type="checkbox"/>																					
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			Total	5																			

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
7			<p>2 marks per benefit</p> <p>E.g.</p> <ul style="list-style-type: none"> • All files can be stored centrally • ... so workers can access files from any computer • ... all computers can update the central database / file • ... Peer-to-peer files might be stored on their own computers / spread across many computers <ul style="list-style-type: none"> • Backups are central • ... all data is backed up each time • ... individual computers do not need to backup their own data • ... Peer-to-peer may need to perform their own backups. <ul style="list-style-type: none"> • Monitor clients • ...to ensure they are working correctly <ul style="list-style-type: none"> • Upgrade software centrally • ...so you do not have to install on each computer individually • Central security (antivirus / firewall) • ... do not need to install protection on all computers • ...Peer-to-peer individual security may need to be installed on individual computers 	4	<p>Do not allow:</p> <ul style="list-style-type: none"> -easy to share data -"more secure" <p>Examiner's Comments</p> <p>This question was not answered well, with few candidate able to demonstrate an understanding of client-server and peer-to-peer networks. The most common response was the central storage of data, although this was often not expanded to explain why this is a benefit.</p>
			Total	4	

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
8	a	i	<p>Max 2 per difference, 1 for RAM, 1 for ROM e.g.</p> <ul style="list-style-type: none"> ◦ RAM is volatile ◦ ROM is non-volatile ◦ RAM stores currently running instructions / programs / applications / OS / data ◦ ROM stores boot-up instructions / bios • RAM can be changed • ROM (normally) cannot be changed 	4	<p>Do not allow e.g. ROM is not for 2nd mark. Mark in pairs</p> <p>Examiner's Comments</p> <p>This question was answered well, with candidates able to express the differences between RAM and ROM, although many candidates gave a full description of one in the first difference space, and a full description of the second in the second difference space. Candidates should be writing both sides of the difference in the given space. Some candidates only gave one side of the difference, or did not full describe both sides.</p>
		ii	<p>2 from</p> <ul style="list-style-type: none"> • More instructions / programs / applications can run at the same time / be held in RAM • Open software faster / respond faster • More memory space for current programs • Run more memory intensive programs / relevant example e.g. computer games / graphic rendering • reduces use of Virtual Memory •less use of hard drive which is slower to access 	2	<p>Examiner's Comments</p> <p>Many candidates were able to identify that virtual memory would be relied on less. Fewer candidates could identify that more programs could be open at once, a common error was that the computer could store more data or more programs which was referring to secondary storage.</p>
		iii	<p>e.g.</p> <ul style="list-style-type: none"> ◦ Increase processor clock speed ◦ Run more FE cycles per second ◦ Faster response ◦ Smoother actions ◦ Less likely to freeze ◦ Add more cores ◦ Run more tasks simultaneously ◦ Better performance for programs that are programmed for multi-core systems <ul style="list-style-type: none"> ▪ E.g. new computer games ◦ Increase cache size ◦ Cache stores frequently used instructions / programs / data 	6	<p>High Level Response (5–6): Several upgrades are identified and there is a detailed explanation of how each of these will impact the computer given in the example. 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): Upgrades are identified, although how these would improve the performance may be weak. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.</p>

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
			<ul style="list-style-type: none"> ◦ Can store more so increase access speed to more frequently used instructions / programs / data • New graphics card • Can carry out more processes for CPU • Can improve speed and quality of graphics • Change hard disk drive to SSD • faster read / write speed 		<p>Low Level Response (1–2): There is an attempt to identify upgrades that could be made. There may be little or no explanation of how these improve performance. The points are poorly expressed or are not related to the context. There is limited, if any, use of technical terms. Errors in grammar, punctuation and spelling may be intrusive.</p> <p>Allow defragmentation and reducing the read time for the hard disk. Do not allow hard drive if referring to secondary storage size, allow for increasing amount of VM.</p> <p>Do not allow:</p> <ul style="list-style-type: none"> • Increasing RAM • Upgrading components that do not affect performance (e.g. peripherals) <p>Examiner's Comments</p> <p>This question was answered well by the majority of candidates, who were able to give a structured response. Most candidates could identify a number of different improvements that could be made. A small number of candidates did not answer the question, and gave a description of how RAM improves the computer, repeating their response to Q.6(b)(ii). Some candidates described hardware that would not affect the performance, such as using a touch screen and adding a printer.</p>

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
	b		<p>2 from</p> <ul style="list-style-type: none"> • Tasks can split between the processors... • ...tasks / processes / software / can be processed faster • ...more processes completed per second <ul style="list-style-type: none"> • Allows multitasking // Run more than one process / task / instruction / data at a time / per clock cycle... • ... tasks / processes / software / can be processed faster • ...more processes completed per second 	2	<p>MUST have given splitting tasks, or multi-tasking to allow speed</p> <p>Faster can only be given a mark if the first bullet(s) have been given.</p> <p>Examiner's Comments</p> <p>This question was answered fairly well, candidates were able to express that two processes could be carried out at once, and they then often got a second mark for identifying that this made it faster. Some candidates could not clearly express what was being processed, or simply stated that it was faster which was insufficient as the actual processes are not carried out faster, it is faster because it is completing two processes at the same time.</p>
			Total	14	
9			<p>eg</p> <ul style="list-style-type: none"> • Braille keyboard / input device • As this is a familiar entry method for blind users <ul style="list-style-type: none"> • Braille print out of transaction • so that customer can review it. <ul style="list-style-type: none"> • Use loudspeakers • To provide audio feedback of actions taken (but not when entering card details). <p><i>(marks in pairs, max 2 pairs)</i></p>	4	<p>Examiner's Comments</p> <p>□□</p> <p>Candidates were required to apply their knowledge and understanding to the given context. Some candidates who were along the right lines were unable to gain full marks because they had not read the question carefully and did not state the hardware modifications needed to implement speech recognition, for example. Some candidates also failed to take the information in the scenario in consideration and appeared to be relying on previous answers from questions on this topic based on different scenarios to influence their answers, e.g. by suggesting that sign language and a puff-suck switch could be incorporated into a user interface for blind users.</p>
			Total	4	