



# Monday 15 November 2021 – Afternoon GCSE (9–1) Computer Science

J276/01 Computer systems

Time allowed: 1 hour 30 minutes

Do not u	use: ulator		



Please write clearly in black ink. Do not write in the barcodes.								
Centre number					Candidate number			
First name(s)								
Last name								

#### **INSTRUCTIONS**

- Use black ink.
- 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 mark for this paper is 80.
- The marks for each question are shown in brackets [ ].
- Quality of written communication will be assessed in questions marked with an asterisk (\*).
- This document has 12 pages.

#### **ADVICE**

· Read each question carefully before you start your answer.

(a) Complete the paragraph about memory by writing the missing terms in the spaces, using the

1	A computer system has a 2.5 GHz processor and 5 GB of RAM.

	word	ds provide	ed.				
	•	ne rator slator	data primary memory stick	hard drive random virtual	instructions read write	changed secondary	closing start-up
	ROI	M stands	for	only m	emory. This store	es the	
	instr	uctions fo	or a computer and o	cannot be			
	RAN	// stands	for	access	memory. This	stores the instr	uctions and
			that are cu	urrently being u	used. If the comp	uter does not h	ave enough
	RAN	/I to run a	process it can mal	ke use of	m	emory.	
	RAN	/I and RO	M are both examp	oles of	mer	nory. Memory Id	cated close
	to th	ne proces	sor that allows fa	ster access th	an from RAM is	called	
	men	nory.					[8]
(b)	(i)	State the	purpose of a CPU				
							[1]
	(ii)	State wha	at is meant by a sir	ngle core 2.5 G	Hz processor.		
							[2]
(c)	Von	Neumann	n architecture inclu	des registers.			
	Ider	ntify <b>two</b> re	egisters used in Vo	n Neumann ar	chitecture.		
	1						
	2						[2]
							- <b>-</b>

Layla uses her computer to create educational games.

2

Lay	ıla ma	akes use of system software.					
(a)	<ul><li>One type of system software is the operating system.</li><li>Identify and describe two functions of an operating system.</li></ul>						
	Fun	ction 1					
	Des	cription					
	Fun	ction 2					
	Des	cription					
		[e]					
(b)	Lav	a also uses utility system software.					
(6)							
	(i)	State the purpose of utility system software.					
	/ii\	Lavia uses a backup utility. She performs both full and incremental backups.					
	(ii)	Layla uses a backup utility. She performs both full and incremental backups.					
		Explain the reasons why Layla performs both full and incremental backups.					
		[3]					

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	(c)	When Layla has finished her educational game, she is going to release it as open source	<u></u> .
		Give one benefit and one drawback of Layla releasing her game as open source.	
		Benefit	
		Drawback	
			[2]
			•
3	A te	chnology company brings out new, updated devices twice a year.	
	(a)	Describe the environmental impacts of the company bringing out new devices twice a year	ar.
			[2]
	(b)	Describe the cultural impacts of the company bringing out new devices twice a year.	
			. [2]

A school asks its students to bring in their own electronic devices (e.g. tablets, laptops, mobile phones) to use in lessons instead of purchasing new equipment.

Discuss the issues surrounding students bringing their own devices. Include in your discussion:     ethical issues     legal issues     privacy issues.	
	••
[8	3]

[6]

6

**5** A program is being created to convert the data capacity of a storage device into a different measure.

The function, calculate(), takes the measurement (e.g. gigabytes) and the number (e.g. 2) as two parameters. It then returns the value in bits. The function returns –1 if an invalid measurement was entered.

Complete the function calculate

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	arlie vice.	has purchased a new tablet computer. The tablet has an internal secondary storage						
(a) Describe what the internal secondary storage device will store.								
(b)		ctorage device is a solid state device.						
(b)	THE	storage device is a solid state device.						
	(i)	Give <b>three</b> benefits of the tablet having a solid state device instead of a magnetic device.						
		1						
		2						
		3						
		[3]						
	(ii)	Give <b>two</b> drawbacks of the tablet having a solid state device instead of a magnetic device.						
		1						
		2						
		[2]						

A u	niversity has buildings in two sites that are 5 miles ap	part.
(a)	Describe the difference between a LAN and a WAN	
		[2]
(b)	Site A has 4 classrooms. Site B has 2 classrooms classrooms is a star topology using a switch. The two	
	Complete the network diagram for <b>site A</b> of the Univ	versity.
	Site A, Classroom 1	Site A, Classroom 2
	Site A, Classroom 3	Site A, Classroom 4
		[2]

7

(c)	Site	B has a higher network performance than site A.
	(i)	Explain how each of the following can contribute to the performance of a network.
		Wifi frequency
		Interference
		Number of concurrent users
		Type of network traffic
		[4]
	(ii)	Identify <b>one</b> other factor that can contribute to the performance of a network.
		[1]
	(iii)	The data transmitted between the two sites uses packet switching. Data is transmitted from a computer in site A to a computer in site B.
		Describe how packet switching can be used when sending data from one site to the other.
		[4]

(d)	The	university want to protec	t their data agai	nst threats wher	connected to the	ne Internet.
	(i)	Describe the threat malv	•	o the university's	s network and g	ive a prevention
		Description				
		Prevention				
						[3]
	(ii)	Describe the threat a broprevention method that t			university's net	work and give a
		Description				
		Prevention				
		rievendon				
						[3]
(e)	Data	a transmitted over the net	work uses differ	ent protocols.		
(-)	Tick	one box in each row to i			elated to email,	transferring files
	о. u					
		Protocol	Email	Transferring files	Accessing websites	
	PC	)P				
	FT	P				
	SM	1TP				
	НТ	TPS				

	<b>(f)</b>	The building is considering the implementation of a virtual network.	
		Describe what is meant by a virtual network.	
			[2]
В	Ide	ntify the legislation that relates to the following scenarios:	
	Ар	rogrammer wants to protect their work from being copied or distributed.	
	A p	erson logs into a computer without permission by guessing the password.	
	Αp	erson makes a request to view financial information held by a public authority.	
	۰۰۰۰۰		••••
	Αn	acker gains access to a company's files over a network without permission.	
	A c	ompany collects data that it does not need about its customers.	••••
		empany contact data that it does not need about its dusternors.	
			[5]

### **END OF QUESTION PAPER**

## 12 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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