



# ...day ... Month Year – Morning/Afternoon GCSE (9–1) Computer Science

J277/01 Computer systems

Time allowed: 1 hour 30 minutes

## Sample Question paper

Do not use: • a calculator		



Please write cle	arly in	black	ink.	Do no	ot writ	te 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.
- 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 this paper in questions marked with an asterisk (\*).
- This document has 12 pages.

#### **ADVICE**

· Read each question carefully before you start to answer.



## Answer all the questions.

1 The specification of two CPUs is shown in 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

Fig. 1

(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 <b>two</b> other parts of a computer that are not in <b>Fig. 1</b> , which could improve the performance of the computers.
1	
2	
	[2]
(c)	Explain <b>one</b> reason why the cache size affects the performance of the CPU.
	[2]
(d)	Identify <b>two</b> events that take place during the fetch-execute cycle.
1	
2	

Nina wants to transfer photos from a digital camera to an external secondary storage device.
(a) Define what is meant by 'secondary storage'.
[1]
(b) Identify the three common types of storage Nina can choose from.
1
2
3
[3]
(c) State four characteristics of secondary storage devices that Nina should consider when choosing a device.
1
2
3
4
[4]

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- 3 A satellite navigation system (Sat Nav) uses RAM and ROM.
  - (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 contains an embedded system. Define what is meant by an 'embedded	•
(c) Identify three devices, other than a Sat Nav, which contain embedded systems.	
2	
	[3]

	[2]
(b) The sample rate is increased on the computer when recording the guitar.	
Give <b>two</b> effects this will have on the recording.	
1	
2	
	[2]
(a) Convert the binary number 11001011 into denary.	
	[1]
(b) Complete a 2-place shift to the right on the binary number 11001011.	
	[1]
(c) Explain the effect of performing a 2-place shift to the right on the binary number 1100101	1.
	[2]

6 The table gives the ASCII code for the characters.

Character	ASCII code
L	76
М	77
N	78
0	79
Р	80

lain how the word MOP will be represented in ASCII.
[2]

(ii) Describe one advantage of using layers to construct network protocols.	thei	owners of a large bakery have a Local Area Network (LAN) with a star topology. They ord supplies over the Internet. When data is transmitted from the bakery to the supplier, netwocols are used.
(i) With regards to network protocols, define what is meant by a 'layer'.  (ii) Describe one advantage of using layers to construct network protocols.  (c) Give two reasons why the bakery may use a star network topology for their LAN.	(a)	Define what is meant by a 'network protocol'.
(ii) With regards to network protocols, define what is meant by a 'layer'.  (ii) Describe one advantage of using layers to construct network protocols.  (c) Give two reasons why the bakery may use a star network topology for their LAN.		
(ii) With regards to network protocols, define what is meant by a 'layer'.  (ii) Describe one advantage of using layers to construct network protocols.  (c) Give two reasons why the bakery may use a star network topology for their LAN.	(b)	TCP/IP is a set of protocols based on layers.
(ii) Describe one advantage of using layers to construct network protocols.  (c) Give two reasons why the bakery may use a star network topology for their LAN.	(2)	
(ii) Describe one advantage of using layers to construct network protocols.  (c) Give two reasons why the bakery may use a star network topology for their LAN.		
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(c) Give two reasons why the bakery may use a star network topology for their LAN.  1		
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1		
1		
1	(c)	Give <b>two</b> reasons why the bakery may use a star network topology for their LAN.
2	1	
2		
	2	

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[2]

(-)	Staff already use strong passwords to protect systems. Explain, with reference to system security, <b>three</b> other ways that the hospital could protect the network system.
1	
2	
3	
	Identify <b>three</b> errors that the hospital staff could make that may endanger the security o network. Outline a procedure that could be put in place to prevent each error.
Erro	Identify <b>three</b> errors that the hospital staff could make that may endanger the security o network. Outline a procedure that could be put in place to prevent each error.
Erro	Identify <b>three</b> errors that the hospital staff could make that may endanger the security o network. Outline a procedure that could be put in place to prevent each error.
Erro Pro 	Identify <b>three</b> errors that the hospital staff could make that may endanger the security on network. Outline a procedure that could be put in place to prevent each error.  or 1
Erro Pro 	Identify <b>three</b> errors that the hospital staff could make that may endanger the security on network. Outline a procedure that could be put in place to prevent each error.  or 1
Erro Pro Erro Pro	Identify <b>three</b> errors that the hospital staff could make that may endanger the security of network. Outline a procedure that could be put in place to prevent each error.  Outline a procedure that could be put in place to prevent each error.  Cedure 1  Cedure 2

[6]

said	staurant has a computer-based ordering system which is running slowly. A technician has that the hard disc drive is fragmented. The technician has suggested using utility software to agment the drive.
(a)	Explain how the restaurant's hard disc could have become fragmented.
	[4
(b)	Explain how defragmentation software could overcome the issue of the slow computer system.

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A law company currently use a Local Area Network (LAN) linked to a Wide Area Network (WAN).

(a) Deline	what is mear	nt by a Wide	Area Network.			
(b) Explain	n <b>two</b> advanta	ages to the la	aw company o	f storing their da	ata in the Cloud.	
1						
2						
				••••		
			a law company	v of storing thei	r data in the Clo	اما
(c) Evolair	two disadva	antange to the	z iaw combani			
(c) Explair	n <b>two</b> disadva	antages to the		, or oroning and		ua.
		_		· -		
1						
1						
1						
1						
1						

10

(d) Fig. 2 lists some actions that may take place in the law company's office. Tick (✓) one box in each row to show which legislation applies to each action.

Action	Data Protection Act 2018	Computer Misuse Act 1990	Copyright Designs and Patents Act 1988
Using a picture for the law company's new logo without the original creator's permission.			
A secretary accessing a lawyer's personal email account without permission.			
Making a copy of the latest Hollywood blockbuster movie and sharing it with a client.			
Storing customer data insecurely.			
A lawyer installing a key logger on the secretary's computer.			
Selling client's personal legal data to a marketing company without their permission.			

Fig. 2

[6]

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**11** \* People often want to buy the most up-to-date smartphones, even though the smartphone they own still works.

Discuss the impact of people wanting to upgrade to the latest smartphone.

In your answer, you might consider the impact on:

- smartphone users
- cultural issues
- ethical issuesenvironmental issues.

 [8]

#### **END OF QUESTION PAPER**

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