

GCSE OCR Computer Science

Practice Set B Paper 1 Computer Systems

Centre name				
Centre number				
Candidate number				

Time allowed:

- 1 hour 30 minutes

You **may not** use a calculator

Surname
Other names
Candidate signature

Instructions to candidates

- Write your name and other details in the spaces provided above.
- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information for candidates

- There are 80 marks available on this paper.
- The marks available are given in brackets at the end of each question.
- Quality of extended responses will be assessed in this paper in questions marked with an asterisk (*).

For examiner's use							
Q	Attempt N ^o			Q	Attempt N ^o		
1				5			
2				6			
3				7			
4				8			
Total							

1. Bryan is building a desktop computer system using various pieces of hardware. He purchases a dual-core CPU which features Von Neumann architecture.

(a) State **one** characteristic of Von Neumann architecture.

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[1 mark]

(b) Explain, with reference to memory and specific registers, the steps of the CPU fetch-execute cycle.

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[4 marks]

(c) Bryan's computer system will have both RAM and ROM. Explain **two** differences between RAM and ROM.

1
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2
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[4 marks]

- (d) Bryan's CPU has 64 kB of Level 1 cache memory and 1 MB of Level 2 cache memory. State **one** difference, other than size, between Level 1 and Level 2 cache memory.

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[1 mark]

- (e) Describe how the Arithmetic Logic Unit (ALU) and the Accumulator work together in the CPU.

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[2 marks]

- (f) When Bryan finishes building his computer, he notices that it is quite slow, so he upgrades the CPU to one that is quad-core. Explain why doubling the number of cores will not necessarily double the performance of his system.

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[3 marks]

Turn over ►

2. Gail manages the storage of data across different departments at a large university. She is considering replacing the magnetic Hard Disk Drives (HDDs) on a number of servers with a different type of storage device.

- (a) State **two** characteristics of storage devices that Gail should take into consideration before upgrading the server storage.

1
2
[2 marks]

- (b) Gail is considering cloud storage and magnetic tape as possible replacements. Compare the benefits and drawbacks of these two options for the university.

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[6 marks]

- (c) A professor needs some experimental data from one of the university servers. He asks Gail to make 30 copies of the data, each on a separate storage device so that they can be handed out to his students. The data is 5 GB in size.

Briefly explain whether each of the following storage devices would be suitable to store the data on.

CD-R optical disks
.....
USB pen drives
.....
External HDD
.....
[3 marks]

3. Paula is the manager of Penfold & Penfold, a talent agency which uses a wireless LAN in their office.

- (a) The computer systems at Penfold & Penfold feature various network-related hardware. One of these pieces of hardware is a Network Interface Controller (NIC). State why this piece of hardware is required.

.....

 [1 mark]

- (b) State the piece of hardware that would be required to connect Penfold & Penfold to an external network.

.....
 [1 mark]

- (c) Paula is considering changing the wireless network to a wired network. Explain **one** advantage and **one** disadvantage of changing to a wired network.

Advantage

Disadvantage

 [4 marks]

- (d) The network setup at Penfold & Penfold is currently peer-to-peer. Describe **two** possible advantages of changing to a client-server network.

1

 2

 [4 marks]

Turn over ►

- (e) Penfold & Penfold have recently been the victim of a cyber-attack. The company had previously installed tools to allow network forensics. Explain how carrying out network forensics would be of benefit to Penfold & Penfold.

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[2 marks]

4. Packet switching is a way of transferring data across a Wide Area Network (WAN).

- (a) The table below lists events that take place during packet switching. Complete the table by numbering the events 1 to 6, to show the order in which the events occur (1 being the first event).

Event	Order
The data is displayed on the recipient's computer.	
Packets are sent across the network.	
The data is split into equal-sized packets.	
Routers direct individual packets across different paths.	
Each packet is given an address, a number, and error checking (checksum) data.	
Packets are reordered based on their number	

[3 marks]

- (b) State **one** benefit of data being transmitted using packet switching.

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[1 mark]

Leave
blank

5. * It is estimated that, globally, over a third of all paid-for software in use by both individuals and companies is pirated.

Discuss the impact of the increased use of pirated software on society.

In your answer, you might consider:

- legal issues
- ethical issues
- cultural implications
- impact on stakeholders

[illegible]

Turn over ►

- (d) Ruby checks her email inbox on her desktop computer and finds that she has received an email from her manager. She later accesses her emails from her phone and deletes the email. When she checks her inbox on her desktop computer again later, the email has been deleted there too.

State the protocol that has handled Ruby's email in this scenario.

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[1 mark]

7. Nick regularly receives suspicious-looking emails claiming to be from banks, charities and other organisations. These emails often contain attachments.

- (a) State the name given to the practice of sending spoof emails.

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[1 mark]

- (b) Explain how anti-malware software can help to prevent malicious emails from attacking Nick's computer system.

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.....
[2 marks]

- (c) Identify **three** types of malware that could target Nick's computer system.

- 1
2
3
[3 marks]

8. Joel uses his desktop computer to trade on various stock markets around the world for his clients. He also stores a lot of sensitive data on his computer.

- (a) Joel wants to purchase a new Operating System for his computer. State **two** security measures that an OS may provide.

1

2 [2 marks]

- (b) Joel plugs a printer into the computer and is asked to install a 'driver'. Explain why Joel will need this 'driver'.

.....

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..... [2 marks]

- (c) After regular use over several years, Joel notices that his computer system takes a long time to open files from his desktop. He notices that the Hard Disk Drive (HDD) appears to be making sounds more frequently.

- (i) State the utility program Joel could use to potentially solve this problem.

..... [1 mark]

- (ii) Explain how the utility program from (i) would improve the performance of Joel's Hard Disk Drive (HDD).

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..... [3 marks]

- (d) After completing a day of trading on the stock markets, Joel creates a detailed report for his clients. Joel uses a custom utility to manage these reports.

At the end of each week (Monday-Friday), the utility creates a new file, and copies all of the daily reports into it. The new file is then compressed. If the compressed file is under 5 MB, it is uploaded to cloud storage and the daily reports are deleted. If not, the compressed file is deleted and an error message is displayed.

Write an algorithm to demonstrate the function of Joel's custom utility.

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[6 marks]

END OF QUESTIONS