OCR
Oxford Cambridge and RSA

Accredited

GCSE (9–1) Computer Science
J276/01 Computer Systems
Sample Question Paper

Date – Morning/Afternoon
Time allowed: 1 hour 30 minutes

You may not use:
• a calculator

First name	
Last name	

Centre number						Candidate number				

INSTRUCTIONS
• Use black ink.
• Complete the boxes above with your name, centre number and candidate number.
• Answer **all** the questions.
• Write your answer to each question in the space provided.
• If additional space is required, use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
• Do **not** write in the bar codes.

INFORMATION
• The total mark for this paper is **80**.
• The marks for each question are shown in brackets **[ ]**.
• Quality of extended responses will be assessed in this paper in questions marked with an *.
• This document consists of **12** pages.

1 Ann wants to purchase a new computer and is looking at two models. The specification of the CPU in each computer is shown in **Fig. 1**.

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

(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 **two** internal components that are not in **Fig. 1**, which could improve the performance of the computers.

....

....

[2]

(c) Explain **one** reason why the cache size affects the performance of the CPU.

....

....

[2]

(d) Identify **four** events that take place during the fetch-execute cycle.

....

....

....

....

[4]

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.

(a) Define what is meant by 'secondary storage'.

....

....

[1]

(b) Identify the **three** common storage technologies Vicky can choose from.

....

....

....

[3]

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

....

....

....

....

[4]

3 Gareth has a satellite navigation system (Sat Nav) in his car that uses RAM and ROM.

(a) **Fig. 2** lists some characteristics of computer memory. Tick (✓) **one** box in each row to show whether each of the statements is **true** for the RAM or ROM in Gareth's Sat Nav.

Fig. 2

	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) Gareth's Sat Nav contains an embedded system. Define what is meant by an 'embedded system'.

....

....

[1]

(c) Identify **three** devices, other than a Sat Nav, that contain embedded systems.

....

....

....

[3]

4 Bill needs to send a document across a network to Ben. Write an algorithm to show how packets are used to send the document, starting from when Bill clicks send (sending), and finishing when Ben reads the document (receiving).

....

....

....

....

....

....

....

....

....

....

....

....

[6]

5 The owners of a large bakery have a Local Area Network (LAN) with a star topology. They order their supplies over the Internet. When data is transmitted from the bakery to the supplier, network protocols are used.

(a) Define what is meant by a 'network protocol'.

....

....

[1]

(b) TCP/IP is a set of protocols based on layers.

(i) With regards to network protocols, define what is meant by a 'layer'.

....

....

[1]

(ii) Describe **one** advantage of using layers to construct network protocols.

....

....

[2]

(c) Explain **four** reasons why the bakery may use a star network topology for their LAN.

....

....

[4]

6 A doctor's surgery stores hundreds of patients' details on its computer network. The surgery is concerned about the security of its patients' sensitive medical data.

(a) Staff are already required to use strong passwords to protect systems. Explain, with reference to system security, **three** other ways that the surgery could protect the system.

....

....

....

....

....

....

....

....

....

[6]

(b) Identify **three** errors that the surgery's staff could make, that may endanger the security of the network and outline a procedure that could be put in place to prevent each error.

....

....

....

....

....

....

....

....

....

[6]

7 A restaurant has a computer-based ordering system which is running slowly. A technician has said that the hard disc drive is fragmented. The technician has suggested using utility software to defragment 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.

....

....

....

....

....

....

[3]

8 A law firm currently use a Local Area Network (LAN) linked to a Wide Area Network (WAN). They want to upgrade their system to utilise cloud storage.

(a) Define what is meant by a Wide Area Network.

....

[1]

(b) Explain **two** advantages to the law firm of storing their data in the cloud.

....

....

....

....

....

....

[4]

(c) Explain **two** disadvantages to the law firm of storing their data in the cloud.

....

....

....

....

....

....

[4]

 Turn over

(d) **Fig. 3** lists some actions that may take place in the law firm's office. Tick (✓) **one** box in each row to show which legislation applies to each action.

Fig. 3

Action	Data Protection Act 1998	Computer Misuse Act 1990	Copyright Designs and Patents Act 1988
Using a picture for the law firm's new logo without the original creators 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 clients personal legal data to a marketing company without their permission.			

[6]

9 * Even though the computer devices they own still work, people often want to buy the most up-to-date models, such as the latest smartphone.

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

In your answer you might consider the impact on:

- stakeholders
- technology
- ethical issues
- environmental issues

……….

……….

……….

....

....

....

....

....

....

....

....

....

....

....

....

[8]

BLANK PAGE