OCR
Oxford Cambridge and RSA

Tuesday 18 January 2022 – Afternoon

Level 3 Cambridge Technical in Applied Science

05874 Unit 22: Global scientific information

Time allowed: 1 hour 30 minutes
C343/2201

C343-I-220-01

You must have:
- the Insert
- a ruler (cm/mm)

You can use:
- a scientific or graphical calculator
- an HB pencil

0 5 8 7 4 – 2 2

Please write clearly in black ink.

Centre number | | | | | | Candidate number | | | | |

First name(s) _____

Last name _____

Date of Birth | D | D | M | M | Y | Y | Y | Y |

INSTRUCTIONS
- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Answer **all** the questions.
- 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.

INFORMATION
- The total mark for this paper is **60.**
- The marks for each question are shown in brackets **[ ]**.
- This document has **16** pages.

ADVICE
- Read each question carefully before you start your answer.

FOR EXAMINER USE ONLY	
Question No	**Mark**
Section A: 1	/10
2	/10
3	/10
Section B: 4	/15
5	/7
6	/8
Total	**/60**

Answer **all** the questions.

Section A

This section relates to the case study on Artimus Discovery (see Insert).

1 The charitable organisation, working alongside the PhD student, is an example of an information holder.

(a) What type of information holder is the PhD student?

..... **[1]**

(b) Identify **three** locations of scientific information from which the PhD student gathers data.

1 .....

2 .....

3 .....

[3]

(c) Suggest **two** ways in which the charitable organisation uses the scientific information it receives from the PhD student.

Explain your answers.

1 .....

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2 .....

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[4]

(d) Identify **one** stakeholder and describe the impact that the PhD student's research may have on farming practices.

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..... **[2]**

2 Artimus Discovery is proposing to offer computer-aided toxicology assessments to its clients.

This proposal requires a renewed risk assessment relating to the safety of company staff in their workplace.

(a) Describe **two** information system protocols that reduce the risk of access by unauthorised persons to computer data.

1 .....

.....

2 .....

..... **[2]**

(b) One system to deter **physical** access by unauthorised persons is the use of internal and external closed-circuit television (CCTV).

Suggest **one** other system that reduces the risk of physical access to the workplace by unauthorised persons.

.....

..... **[1]**

(c) One piece of UK legislation defines four main offences that may be committed by persons having unauthorised access to computer materials.

(i) What is the name of this legislation?

Tick (✓) **one** box.

Computer Misuse Act 1990	☐
Data Protection Act (DPA) 1998	☐
Information Commissioner's Office (ICO) codes of practice	☐

[1]

(ii) Outline the **four** main offences shown in the legislation identified in **(c)(i)**.

1 .....

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2 .....

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3 .....

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4 .....

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[4]

(d) The Information Security Management System (ISMS) used by Artimus Discovery has the facility to track who has custody of any document at any given time.

This produces data that are used to compile a detailed record over time.

This record is called an audit log.

Suggest how the audit log reduces the risk to data integrity.

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..... **[2]**

3 Artimus Discovery uses cloud computing to store some of its data.

(a) **(i)** State what is meant by the '**cloud**' when applied to the storage of scientific information.

.....

..... **[1]**

(ii) Suggest what is meant by the term **cloud computing**.

.....

..... **[1]**

(b) One service provider lists five advantages of cloud storage, as shown in the table.

A	Usability
B	Bandwidth
C	Accessibility
D	Disaster recovery
E	Cost savings

Identify which advantage listed in the table is best described in each of the following statements.

Write the correct letter (**A**, **B**, **C**, **D** or **E**) next to each statement.

1 Provides a second copy of important files. .....

2 Does not require internal power to store information remotely. .....

3 Files can be moved easily between cloud and local storage. .....

4 Eliminates problems from trying to send large files by email; links to files can be sent in emails instead. .....

[4]

(c) Suggest **two** disadvantages of cloud storage.

1 .....

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2 .....

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[2]

(d) Information can also be stored using magnetic media.

Give **one** example of magnetic media and explain one benefit of using this system to store information.

Example .....

Benefit .....

.....

.....

[2]

Section B

You do not need the case study to answer these questions.

4 Rheumatic heart disease (RHD) is the most common acquired heart disease in children in many countries of the world, especially in developing countries.

Rod is a sonographer. He specialises in acquiring ultrasound video scans that can be used to diagnose RHD. Interpreting the scans however, can take years of training for a doctor.

Rod works for a company which is designing an artificial intelligence (AI) software tool capable of recognising the signs of RHD in ultrasound video scans. Thousands of video scans are required to 'teach' the AI software. The software will assist doctors to diagnose RHD in developing countries.

(a) Rod uses optical media to store the ultrasound videos.

Give **four** reasons why optical storage is a suitable choice.

1 .....

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2 .....

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3 .....

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4 .....

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[4]

(b) **(i)** State the name of the **legislation** which protects the intellectual property of the company that Rod works for.

..... **[1]**

(ii) Outline **five** ways in which this legislation works.

1 .....

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2 .....

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3 .....

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4 .....

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5 .....

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[5]

(c) It is essential for the interests of patients to be protected.

In the UK, the company must abide by relevant legislation.

One example of such legislation is the Freedom of Information Act 2000.

(i) Identify one **other** piece of legislation which protects the interests of patients.

..... **[1]**

(ii) Outline **four** reasons why this type of legislation may be **less** effective in developing countries compared with the UK.

1 .....

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2 .....

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3 .....

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4 .....

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[4]

5 Technical controls are commonly used to reduce risks to information security.

(a) Draw lines to connect each technical control with the correct example of how this technical control is achieved.

Technical control	Example of how technical control is achieved
Access control	Control of network traffic
Encryption	Data is converted using an algorithm
Firewall	Personal identification number
	Closed-circuit television (CCTV)

[3]

(b) The Information Commissioner's Office (ICO) issues a code of practice for the use of surveillance cameras e.g. CCTV.

Which **two** statements explain why the ICO issues a code of practice?

Tick (✓) **two** boxes.

- To address public concerns regarding the use of surveillance cameras. ☐
- To advise operators on how to carry out surveillance in secret. ☐
- To advise operators on the best types of image-recording systems. ☐
- To explain the legal requirements to operators. ☐

[2]

(c) Administrative controls are also used to reduce risks to information security.

Suggest what is meant by 'administrative control' and give **one** example.

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..... **[2]**

Turn over for the next question

6 The UK has over 400 000 hectares of contaminated land, much of it a legacy of the Industrial Revolution.

The incentive to regenerate contaminated land is driven by its high value in areas of economic growth and by environmental regulations.

Soil analysis determines:

- the presence of toxic substances e.g. mercury
- the physical properties of the soil e.g. pH
- the presence of certain types of bacteria.

The results of the soil analysis are used to assess the risks involved and make recommendations regarding the removal and treatment of contaminated soils.

(a) In 2006, the UK government formed the Olympic Delivery Authority to help organise the London 2012 Olympic Games.

The London 2012 Olympic Park had over 3000 soil sampling points with over 5 million chemical test results.

(i) What is the correct way of classifying this information?

Tick (✓) **one** box.

Anonymised ☐

Confidential ☐

Private ☐

Public ☐

[1]

(ii) Explain your choice of classification in **(a)(i)**.

.....

..... **[1]**

(b) Peter is an expert in soil analysis. He works for a company that has been awarded a "kitemark for excellence" in the area of Quality Management of scientific information.

Discuss the characteristics of Quality Management of scientific information and suggest the likely benefits that good-quality information has on the stakeholders who invest in the regeneration of contaminated land.

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..... **[6]**

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined pages. The question numbers must be clearly shown in the margins – for example 1(a) or 2(b).

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