

Friday 6 June 2025 – Afternoon

Level 3 Cambridge Technical in Applied Science

05874 Unit 22: Global scientific information

Time allowed: 1 hour 30 minutes

C343/2506

You must have:

- the Insert (inside this document)
- a ruler (cm/mm)

You can use:

- a scientific or graphical calculator



Please write clearly in black ink. **Do not write in the barcodes.**

Centre number

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Candidate number

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First name(s)

Last name

Date of birth

D	D	M	M	Y	Y	Y	Y
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INSTRUCTIONS

- Use black ink.
- 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.
- Use the Insert to answer the questions in Section A.

INFORMATION

- The total mark for this paper is **60**.
- The marks for each question are shown in brackets [].
- This document has **12** pages.

ADVICE

- Read each question carefully before you start your answer.

Answer all the questions

Section A

This section relates to the pre-release case study Sources A, B and C.

1 Categories of information holders are:

1. individual researchers
2. research department of companies
3. educational institutions / governments
4. research groups
5. charitable organisations
6. international bodies

The general characteristics of these categories can be described by how they work, how they conduct their research, their motivations and how they are funded.

Some of these characteristics are:

- A. Typically works independently or as part of a small team
- B. Typically works as part of a larger corporate structure
- C. Typically works on collaborative projects with a shared research goal
- D. Typically has a broad mandate for research and education
- E. Focuses on specific causes or issues such as health or environment
- F. Engagement in both basic and applied research
- G. Expertise in a specific area
- H. Funded by donations, philanthropy and grants
- I. Funded by other sources

(a)

(i) What category of information holder (**1 to 6**) is the author of **Source A**?

..... [1]

(ii) Give the letters of **two** characteristics (**A to I**) of the author of **Source A**.

1 2 [2]

(b)

(i) Which category of information holder (**1 to 6**) applies to the designers of the test in **Source B**?

..... [1]

(ii) Give the letters of **four** characteristics (**A to I**) that apply to the designers of the test in **Source B**.

1 2 3 4 [2]

[Total: 6]

2

- (a) The boxes on the left are items of scientific information from **Source C**.

The boxes on the right are some locations of scientific information.

Draw **one** straight line from each piece of scientific information to its location.

scientific information	location
Alphanumeric barcode activation	home
ISO 13485 accreditation	workplace
Your LetsGetChecked sample collection box	online

[3]

- (b) Another location of scientific information is urban.

- (i) State what is meant by an urban location.

.....
 [1]

- (ii) Suggest **two** advantages of an urban location for scientific information.

Advantage 1

 Advantage 2
 [2]

- (c) **Source A** is available as either a hardback or a paperback book.

It can also be downloaded from an online library as an eBook or as an audiobook.

Describe **two** access issues for the transmission of **Source A** from an online library.

1

 2
 [2]

[Total: 8]

Turn over

3 Good-quality scientific information has three characteristics.

These characteristics include accuracy, accessibility and scientific terminology.

(a) The table contains some extracts from **Sources A, B and C**.

Complete the table by placing **one** tick (✓) in each row to indicate which characteristic each extract is **most** associated with.

Extract	Source	Accuracy	Accessibility	Scientific Terminology
... diacetyl tartaric acid esters of mono- and diglycerides (also known as E472e or DATEM)	A			
<i>Microbiome</i> volume 9, Article number: 66 (2021).	A			
16s rRNA sequencing	B			
An overall systemic wellness score	B			
State-of-the-art online interactive platform to view and track your results	B			
C-reactive protein (CRP) ... is one of the most sensitive acute-phase markers of inflammation.	C			
... kits are manufactured within our ISO 13485 certified facility,	C			

[7]

(b) Poor-quality scientific information has consequences.

Two of these consequences are:

- Anxiety
- Misinformation

Explain what is meant by the terms anxiety and misinformation.

Use **Source A** to describe some of the health concerns related to ultra-processed food.

Use **Sources B and C** to describe the information that people using these services are seeking.

[6]

.....

.....

.....

.....

.....

Source C states that people can have their data linked to a unique alphanumeric barcode.

Draw a circle around the correct classification.

non-sensitive	partially anonymised	public	[1]
---------------	----------------------	--------	-----

'We use appropriate technical and organisational measures to ensure security and confidentiality of your information.'

technical

organisational

[2]

[Total: 16]

Section B

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

- 4** The storage, use and access to information in the UK is subject to different forms of legislation, regulation and regulators.

The different forms include:

- A – Data Protection Act
- B – Protection of Freedoms Act
- C – Freedom of Information Act
- D – Computer Misuse Act
- E – Information Commissioner's Office
- F – Copyright, Designs and Patents Act
- G – Equality Act
- H – UNCRPD

Use the letters **A** to **H** to identify the relevant act, office or convention in each situation.

Each letter may be used once, more than once or not at all.

(a)

- (i)** Parties to this regulation are obligated to ensure access, on an equal basis with others, to information and communication technologies and systems.

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

- (ii)** This legislation covers protected characteristics as well as provisions related to disability discrimination.

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

- (iii)** This legislation regulates the collection and use of biometric data such as DNA samples.

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

- (iv)** This body is responsible for promoting information rights and ensuring compliance with the UK's data protection legislation.

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

- (v)** This legislation outlines the penalties for those found guilty of accessing a computer system without authorisation.

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

- (vi)** An international treaty whose provisions may require incorporation into domestic law.

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

(b) Data protection legislation varies between countries and regions.

These differences occur due to the following statements:

- cultural and social factors
- data subject rights
- data transfer mechanisms
- enforcement mechanisms
- legal frameworks
- scope and coverage.

Use these differences to complete the following sentences.

You may use each statement once, more than once or not at all.

(i) Some countries place a higher value on privacy and personal autonomy than others.

These attitudes towards privacy are due to
 [1]

(ii) Some jurisdictions provide opportunities for individuals to request the deletion of personal information in certain circumstances.

These opportunities give [1]

(iii) Some countries have comprehensive data protection laws while others have sector-specific laws that apply to particular industries or types of data.

These are differences in [1]

(iv) Some countries require individuals to explicitly opt in to the collection and processing of their personal data (opt-in consent) while others operate on an opt-out basis.

These are differences in [1]

(v) Compliance with data protection laws is overseen by the Federal Trade Commission (FTC) in the United States and by Data Protection Authorities (DPAs) in the European Union.

These are differences in [1]

(c) Complete the following sentence.

Use terms or abbreviations from the list.

Each term or abbreviation may be used once, more than once or not at all. [4]

government the internet UNCRPD information Data Protection Act
education a disadvantage a human right important

The recognises under articles 9 and 21 that access to
 communication and services such as
 is

[Total: 15]

Turn over

- 5 A web designer is developing a website for an IT company. A page of the website is shown below. It explains what the company's service is and how the company ensures the security and integrity of patient data.

We provide a cloud computing service that collects, compiles and analyses clinical and other data from a wide range of medical sensors and monitors.

The data is transmitted to the cloud where our algorithms process it for medical professionals to make informed decisions about the care of their patients.

We ensure the security and integrity of your data with robust data retrieval systems featuring:

- Access Controls
- Authentication
- Encryption
- Data Integrity
- Audit Logs
- Backup and Recovery
- Data Redundancy
- Compliance and Regulatory Requirements
- Continuous Monitoring and Risk Assessments

- (a) Access controls and user authentication can be used to increase data security.

Describe **two** risks that are reduced by the use of access controls and user authentication.

1

.....

2

.....

[2]

- (b) Explain how encryption supports data integrity.

.....

.....

.....

..... [2]

- (c) The identity of the data user is one of the details that is recorded in the audit log when data is accessed.

Suggest **three** other details that should also be included in the log to complete the audit trail.

- 1
-
- 2
-
- 3
-
- [3]

- (d) Describe **two** events that will result in the use of data recovery mechanisms.

- 1
-
- 2
-
- [2]

- (e) Data redundancy is when many copies of the same data are stored in more than one place at a time.

Which principle of information security is most affected by data redundancy?

..... [1]

- (f) Explain how regulatory requirements protect the data of individuals.

.....

.....

.....

..... [2]

- (g) One of the features of the cloud computing service refers to continuous monitoring and risk assessment.

Suggest **one** way in which these two activities ensure the security and integrity of data.

.....

..... [1]

- (h) The use of cloud computing services by healthcare providers has major benefits.

Explain **two** of these benefits.

Refer to the impact of these services on knowledge where the stakeholder is an entire population in your answer.

.....

.....

.....

..... [2]

[Total: 15]

END OF QUESTION PAPER

[illegible]

Oxford Cambridge and RSA

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