OCR
Oxford Cambridge and RSA

Monday 3 June 2024 – Afternoon

Level 3 Cambridge Technical in Applied Science

05874 Unit 22: Global scientific information

Time allowed: 1 hour 30 minutes
C343/2406

C343/2406

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

You can use:
- a scientific or graphical calculator

0 5 8 7 4 – 2 2

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

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

First name(s) _____

Last name _____

Date of birth | D | D | M | M | Y | Y | Y | Y |

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 page 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.

Section A

This section relates to Sources A and B (see Insert).

1

(a) The table shows different categories of information holder.

Category	Letter
Individual researcher	A
Company research department	B
Educational institution	C
Government-funded scientific research institute	D
Government agency	E
Charitable organisation	F
International body	G

Use the table to identify the following information holders included in **Sources A** or **B**.

Write **one** letter **A**, **B**, **C**, **D**, **E**, **F** or **G**.

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

A. J. Ashworth .....

Federal Aviation Administration (FAA) .....

John Deere engineers .....

NASA's Jet Propulsion Laboratory (JPL) .....

University of Arkansas .....

[5]

(b) The table shows some locations of scientific information.

Location	**Letter**
Countries	A
Home	B
Library	C
Online	D
Rural	E
The cloud	F
Workplace	G

Use the table to identify the following locations included in **Sources A** or **B**.

Write **one** letter **A**, **B**, **C**, **D**, **E**, **F** or **G**.

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

Data stored at John Deere .....

Data stored within a network of ground stations .....

Mass flow and moisture data .....

Satellite tracking data .....

[4]

2 With reference to both **Source A** and **B** identify specific examples of scientific information and describe the financial and other benefits of applying this information to agricultural practices.

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

3 Scientific information requires classification and quality management.

(a) Information is classified by considering the potential impacts of unauthorised disclosure.

The table shows different information classifications.

Category	Letter
Public	A
Sensitive	B
Private	C
Confidential	D
Classified	E
Partially anonymised	F
Completely anonymised	G

Use the table to identify the following classifications.

Write **one** letter **A**, **B**, **C**, **D**, **E**, **F** or **G**.

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

Details of John Deere engineers' employment history .....

Farmers' profit forecasts .....

Orbital positions of GPS satellites .....

RTG programming code .....

Technical details of a third-generation StarFire .....

The number of John Deere engineers working on the StarFire receivers .....

[6]

(b) The characteristics of quality management are accuracy, accessibility and scientific terminology.

(i) Describe the impact of accuracy by selecting information from **Source A**.

.....

.....

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

(ii) Describe the impact of accessibility by selecting information from **Source A**.

.....

.....

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

(iii) Give **two** examples of scientific phrases used in **Source B**.

1 .....

2 .....

[2]

(iv) Suggest **one** reason why the authors use the phrases you chose in **3(b)(iii)**.

.....

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

(c) Suggest, with a reason, whether the iTEC-Pro can be protected by patent legislation.

.....

.....

.....

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

Section B

You do not need Source A and B to answer these questions.

4 Global information and protection legislation and regulation includes the UNCRPD.

(a)
(i) Complete the following sentence.

The UNCRPD is the United Nations Convention on the rights of

..... with ..... .

[2]

(ii) Articles 9 and 21 of this legislation are concerned with rights of access.

State **two** of these rights of access.

1 .....

2 .....

[2]

(b) Barriers to interaction and navigation can be reduced by specialist software and assistive hardware.

The table lists different types of software and hardware features.

Put a tick (✓) in the appropriate column for the **three** software applications and **three** hardware applications that reduce barriers to interaction and navigation.

Use **six** ticks only.

Feature	**Software application that reduces barriers to interaction and navigation**	**Hardware application that reduces barriers to interaction and navigation**
Adapted mouse or trackball		
Audio description / screen reader		
Backup to cloud storage		
Eye tracking		
Touch screen		
Voice recognition		
Wireless keyboard		
Word prediction / predictive text		

[6]

5 Alex is an IT manager for a manufacturer of food products.

Alex reads about a new software package designed to support quality, compliance and production processes.

Some of the features offered by the software are:

- integration of multiple product inspection technologies and devices
- instant connectivity for full data visibility and functional control of inspection devices
- meeting new security requirements and IT environments and supports development
- access to service support
  - professional installation
  - regular update service
  - immediate technical support
  - high levels of IT security and data integrity

(a) Integrity is one of the three principles of information security.

(i) State **three** features of data integrity.

1 .....

2 .....

3 .....

[3]

(ii) State the **two** other principles of information security. For each principle, identify a feature offered by the software that supports that principle.

principle 1 .....

software feature .....

principle 2 .....

software feature .....

[4]

(b) Remote inspection devices are designed to detect physical contamination of the food products.

One device uses X-rays to detect tiny fragments of metal, bone, glass, plastic and stone that may be present in food products as they pass along a conveyor belt.

Information obtained when using the device is good quality if:

1 a warning light shows when the device is on

2 there is excellent traceability in the event of a product recall

3 detection results in automatic rejection of the product from the conveyor belt

4 the rate of false rejects is minimised

5 any stoppage of the conveyor belt results in automatic shut down of the X-ray device.

(i) Which numbered statement is most related to the company's **reputation** with its customers?

Number .....

[1]

(ii) Which numbered statements are most related to **reassurance** that risks to employees working by the conveyor belt are minimised?

Number ..... and number .....

[1]

(iii) Which numbered statement is most likely to result in **delusion** that the product is safe to eat if the information is poor quality?

Number .....

[1]

(c) Alex is officially registered as a data controller.

The registration is held by an independent public body within a government department.

(i) State the name of this independent public body.

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

(ii) Suggest **three** functions of this independent public body.

1 .....

2 .....

3 .....

[3]

6 One risk to information security is the intentional destruction of data.

(a) State **one** other risk to data security.

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

(b) One impact of the intentional destruction of data is loss of contractual agreements.

One example of a contractual agreement relating to information systems is the outsourcing of website development.

Suggest **three** other contractual agreements relating to information systems.

1 .....

2 .....

3 .....

[3]

(c) One way of minimising the risk to data is the use of encryption.

Suggest how algorithms and keys are used by computers to encrypt plain text.

.....

.....

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

END OF QUESTION PAPER

EXTRA ANSWER SPACE

If you need extra space use this lined page. You must write the question numbers clearly in the margin.